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PATH DEPENDENCE, ANTI-FRACKING MOBILIZATION, AND SHALE POLICY  
DIVERGENCE IN NEW YORK AND PENNSYLVANIA

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by

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## ABSTRACT

This dissertation examines the political dynamics surrounding shale policy development in two states, New York and Pennsylvania. These states sit atop one of the most important shale energy plays in the United States, the Marcellus Shale, and were flashpoints in the controversy over fracking. Whereas Pennsylvania experienced extensive shale energy development, virtually none occurred in New York due to a preemptive moratorium imposed in 2008. In 2015, New York became the first, and to date, the only state with substantial shale energy resources to ban fracking. Pennsylvania, like most states, allowed shale drilling to proceed while stronger regulations were slowly developed and implemented. This research employs a “minimalist” path dependency framework to understand why these states adopted such different shale policies.

Pennsylvania was similar to other shale producing states in that a history of fossil fuel extraction created a favorable context for the oil and gas industry. By contrast, natural resource extraction was never an important part of New York’s economy. I argue that distinct histories of resource extraction contributed to different interest group dynamics, competitive advantages, and political calculations in these states, which in turn, led to shale policy divergence. In both states, political decision-making occurred within a context of increased environmental activism and therefore, provides an opportunity to examine the interaction between social movement dynamics and the policy process. Thus, this dissertation speaks to students of environmental politics, as well as, a wider community of scholars concerned with politics and policy more generally.

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## CHAPTER ONE

### SHALE POLICY DEVELOPMENT AMONG THE U.S. STATES

In the early 2000s, technological advancements in horizontal drilling and high-volume hydraulic fracturing (HVHF) revolutionized the U.S. oil and gas industry. These technologies led to drilling in unconventional shale reservoirs, which dramatically increased oil and gas production in the United States. HVHF, also known as fracking, is a controversial technology that is opposed by some environmentalists. Debates over the environmental risks of unconventional drilling and fracking have led scholars to question why states impose more or less stringent environmental regulations on the shale energy industry. This study takes advantage of a unique case of shale policy divergence in New York and Pennsylvania to examine how the historical influence of fossil fuel extraction shapes states' shale policies.

New York and Pennsylvania sit atop the Marcellus Shale, which is the most expansive shale gas reservoir in the United States. In Pennsylvania, a major drilling boom within the Marcellus Shale led the state to become the nation's second largest natural gas producer. Pennsylvania, like most major shale producing states, adopted policies that encouraged the rapid expansion of the shale gas industry. Shale gas drilling did not occur in New York because this state placed a preemptive moratorium on fracking in 2008, and instituted a total fracking ban in 2015. A study of these two states allows for a comparison of a typical case (Pennsylvania) and a deviant case (New York) of shale policy development.

Although it is widely recognized that energy dependent states prioritize fossil fuel extraction over environmental protection (Davis 1993; Hochschild 2018; Rabe and Mundo 2007), researchers have largely failed to consider how a state's extractive history influences shale policy development. A comparison of New York and Pennsylvania demonstrates that a state's history of fossil fuel extraction significantly influences its shale policies. It does so by shaping the political context within which interest mobilization and policymaking occur. In New York and Pennsylvania, distinct histories of resource extraction and urban influence combined with trends in political partisanship, interest group mobilization, contingent events and particular strategic actions to produce shale policy divergence. The following chapters examine how these factors shaped each state's particular shale policy path.

Historical differences in resource extraction and urban influence produced distinct trajectories of environmental mobilization and political decision-making in these states. Whereas a popular anti-fracking movement significantly influenced shale policies in New York, the Pennsylvania anti-fracking movement was weak and ineffectual. In Pennsylvania, the historical dominance of the energy industry, particularly coal mining, created barriers to environmental mobilization. In New York, the relative absence of extractive industries and an urban elite with an interest in environmental preservation contributed to mass mobilization against fracking. Distinct extractive and environmental histories also shaped the policy frames and political interests of policymakers, which created different sets of political opportunities for environmental activists in these states. Although a policy status quo supportive of oil and gas development existed in New York prior to the shale gas boom, the small size of the industry meant that policy support for

drilling was weak and vulnerable to challenge. By contrast, the energy industry was well-entrenched in Pennsylvania, which made strong opposition to drilling an untenable position for most politicians. This research shows how the historical context of environmental mobilization and policymaking fundamentally shaped the trajectory of shale policy development in each state.

The current chapter lays the foundation for the following analyses by introducing the reader to shale energy development and the political controversy over fracking. Next, I present the theoretical approach guiding the analysis. I employ a minimalist approach to path dependence, which is often criticized by institutionalists in economics and political science, and comparative-historical scholars. I challenge this criticism and argue that minimal path dependency theories are a valid and useful form of historical explanation. I illustrate how so by sketching the outlines of path dependence in New York and Pennsylvania. This is followed by a discussion of the Marcellus Shale gas boom. The chapter concludes with a plan of the dissertation.

## FRACKING: ACTIVISM, POLITICS, AND POLICY

The development of unconventional shale reservoirs reversed a trend of declining oil and gas production and rising prices in the United States. Thus, many observers welcomed the shale energy boom as contributing to America's economic strength and energy independence. Yet, shale energy development also led to political controversies over unconventional drilling and fracking, which environmentalists argued had

significant negative impacts on the environment and public health. Anti-fracking movements emerged in every state where shale drilling occurred, and pressured lawmakers for stronger regulations or a total ban on unconventional oil and gas development (UOGD). These movements were small and politically weak in most states with major shale energy resources, including Pennsylvania. The New York anti-fracking movement was unique in having strong grassroots support. It was also well-organized, well-resourced, and politically connected. These differences were major factors that contributed to shale policy divergence. I describe the political controversy over UOGD and fracking and briefly outline key policy events in these states.

The shale energy boom dramatically changed the energy landscape within the United States. From 2005 to 2013, natural gas production rose 35%, largely due to the development of shale gas resources within the Lower 48 states (U.S. Energy Information Administration 2014). The development of shale deposits was also largely responsible for the first increase in U.S. crude oil production since 1985 in 2009, and the highest annual growth rate (16.2%) since 1940 in 2014 (U.S. Energy Information Administration 2015). This led many U.S. observers to view UOGD and fracking favorably as ushering in a new era of energy abundance and energy security.

Many politicians in states with shale resources were supportive of the drilling boom. In states like New York and Pennsylvania, where oil and gas production had long been in decline, shale drilling offered an opportunity to revitalize a failing industry, and infuse struggling rural communities with new economic development. For landowners, the shale energy boom presented a possible windfall of gas lease and royalty payouts. Small businesses stood to benefit from an influx of temporary drill rig workers. Even

many environmental organizations could see benefits to increased natural gas production, which was framed as offering a cleaner alternative to coal. However, there were also negative impacts associated with shale drilling that led some to view the risks as greater than the possible benefits.

Shale gas development requires enhanced methods of recovery and greater infrastructure than conventional drilling. The most controversial aspect is the well stimulation process known as fracking. After drilling a vertical well, operators typically drill out horizontally and set off a series of explosions to crack the shale. Pressurized water — mixed with sand and various chemicals — is injected into the wellbore to expand and hold open the crevices, which allows gas to flow up to the wellhead. This process is also referred to as high-volume hydraulic fracturing (HVHF) because it utilizes a large amount of water, anywhere from 2 million to 4 million gallons per well (Ground Water Protection Council and ALL Consulting 2009). It was not long after shale gas drilling began that environmental activists began to raise concerns over fracking. Opponents to fracking highlighted water quality issues, including the possible pollution of ground and surface water from drilling chemicals and over-consumption. Opponents also criticized the industrial nature of shale drilling. Well pads are four to six times larger than conventional single-acre pads. The increased size is necessary to accommodate a greater number of holding tanks, waste pits, equipment, and trucks necessary to drill and stimulate a horizontal well. Critics raised concerns over truck traffic, noise, degraded infrastructure, air pollution, and a host of other environmental and human health issues often associated with industrialization and technological change.

Throughout the 2010s, the risks of fracking became a highly publicized issue, and local conflicts over shale drilling expanded into state and national anti-fracking campaigns. Local anti-fracking organizations formed in every state where shale drilling occurred, and in states without unconventional oil and gas reserves. Many national environmental advocacy organizations (EAOs) also took up the issue. While the major EAOs largely sought stronger regulation, a number of national groups, including Greenpeace USA, Environmental Action, and Food & Water Watch supported an outright ban on fracking. In a few short years, shale energy and fracking went from being relatively obscure topics to becoming major environmental issues. State-based anti-fracking movements, which began as loose and informal coalitions in the late 2000s, produced formal network organizations, such as New Yorkers Against Fracking, Pennsylvanians Against Fracking, Californians Against Fracking, and Coloradans Against Fracking. These groups, in turn, formed part of a national coalition, Americans Against Fracking, which supported local and national efforts to end shale energy development.

The anti-fracking movement presented significant challenges to the oil and gas industry. For example, activists successfully led campaigns to ban fracking in hundreds of cities across the U.S., and in three states (New York, Vermont, and Maryland). Yet, anti-fracking mobilization largely failed to stall the pace of development within most major shale fields, and it is unlikely that the largest oil and gas producing states, or the federal government will enact total fracking bans. Nevertheless, the political consequences of opposition to fracking remain to be seen. The cause has become linked



to the broader climate movement and has energized efforts to transform American energy policy and end the use of fossil fuels.

Although anti-fracking movements largely failed to constrain the oil and gas industry, oppositional mobilization strongly influenced public discourse surrounding shale energy, and encouraged states to adopt policies to mitigate the environmental risks of shale drilling. The federal government has largely devolved environmental oversight of oil and gas operations to the states (Rabe and Borick 2013). Environmental activists often cite the Energy Policy Act of 2005, which excluded all non-diesel hydraulic fracturing operations related to oil and gas production from federal Environmental Protection Agency (EPA) regulations under the Safe Drinking Water Act. However, the industry has long benefited from statutory exemptions from the Clean Water Act, the Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (Rabe 2014). Traditionally, the states have been the primary regulators of oil and gas development. With the expansion of environmental risks associated with unconventional drilling and fracking, it is important to understand the factors shaping shale policy development at the state-level.

Although there is considerable variation in particular shale policies at the state-level (Cook 2014; Davis 2012; Krupnick, Richardson, and Gottlieb 2015; Rabe 2014; Weible and Heikkila 2016), almost all states with significant shale energy resources have taken a favorable stance towards UOGD. Shale policy development in Pennsylvania followed a common pattern among major shale producing states. When drilling within the Pennsylvania Marcellus Shale took off in 2008, policymakers did not immediately see the need for new oil and gas regulations. Only after environmental issues began to mount,

and the practice of fracking became politicized did efforts to strengthen regulations for UOGD wells emerge. In 2012, Pennsylvania adopted Act 13, which imposed modest reforms to existing environmental regulations. However, this legislation did not significantly increase the regulatory burden of the industry.

New York State, by contrast, is a deviant case relative to a general pattern of state support for oil and gas development. Intense public concern over UOGD and fracking led policymakers in New York to take a precautionary approach to regulation. New York imposed a preemptive moratorium on HVHF wells in 2008, and conducted a comprehensive environmental review of the practice. In 2015, regulators concluded that unconventional drilling presented greater risks than benefits for New York State, and imposed a ban on fracking. This decision presented a rare deviation from policies encouraging fossil fuel extraction, which energy producing states have traditionally adopted. Why did New York adopt such a radically different approach to UOGD compared to other states with major shale resources?

To answer this question, I contrast New York's path of shale policy development with a more typical pattern observed in Pennsylvania. New York and Pennsylvania are neighboring states that, in some respects, are quite similar. Both are relatively large in terms of land area, population, and gross domestic product (GDP), and characterized by a substantial rural/urban divide with regards to culture, politics, and economic prosperity. Yet, there are also notable differences between these states. Pennsylvania tends to be more politically conservative than New York, and as a major coal producer, was strongly influenced by its historical dependence on natural resource extraction. By contrast, politics in New York State are dominated by a liberal urban elite centered in New York

City. Although some oil and gas development long existed in New York State, natural resource extraction was never an important industry. This is a significant fact, one that I argue importantly helps to explain shale policy divergence between New York and Pennsylvania.

I argue that historical differences in natural resource extraction and urban influence combined with trends in political partisanship, interest group mobilization, contingent events and particular strategic actions to produce shale policy divergence. The concept of path dependence provides a theoretical lens for understanding the multiple and combinative causes of shale policy trajectories. Path dependence refers to the idea “that what has happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time” (Sewell 2005: 100). Whereas Pennsylvania followed a path of carbon dependence in which the fossil fuel industry, though its historical dominance, had significant political influence, New York was oriented towards a path of environmental preservation that gave preference to the interests of liberal urban elites. The following chapters describe in greater detail the differences that set these states on alternative trajectories of shale policy development, and how these trajectories eventually played out.

The remainder of this chapter reviews the literature on shale policy development and describes in greater detail the patterns observed for most high producing shale energy states. This is followed by a description of the theoretical approach, and an overview of path dependence in New York and Pennsylvania. Next, I provide a short introduction to the Marcellus Shale gas boom. Chapter One concludes with a brief outline of the

dissertation and describes the research questions motivating each of the forthcoming chapters.

## FACTORS SHAPING STATE SHALE POLICIES IN THE UNITED STATES

Over the past decade, the rapid expansion of shale energy production has led to policy concerns over how to balance the economic advantages of resource development with efforts to maintain environmental quality. A growing body of academic scholarship has sought to understand how state policymakers have responded to this issue (Davis 2017b). This research has found trends in political polarization, environmental advocacy, and contingent events and strategic action to be influential for particular trajectories of shale policy development. Research on state-level shale policy development also indicates that the oil and gas industry wields considerable influence in energy dependent states. I consider previous research findings regarding the similarities among energy producing states, and the factors that contribute to the adoption of more or less environmentally friendly regulatory regimes. Additional research on how a state's history of resource extraction shapes political decision-making may improve our understanding of shale policy development. Consideration of the historical context of environmental policy suggests a revision to the "race to the bottom" thesis, which accounts for how historical patterns of economic development likely play into policymakers' assessments of competitive advantage.

Shale policy development is an important topic, both substantively and theoretically. The federal government has largely devolved shale policy development to

the states. Therefore, how states decide to regulate the industry will have important consequences for years to come. Research on state-level environmental policies finds significant variation in state regulatory approaches, with some states adopting policies that prioritize oil and gas development, while others have sought more of a balance between economic development and environmental protection. Such differences highlight ongoing questions about the consequences of federalism in environmental governance, and whether we might observe a “race to the bottom” in fracking regulations.

While there are relevant policy differences among shale producing states, with the exception of New York, all states with significant shale energy resources have adopted regulatory regimes that are generally favorable towards the oil and gas industry. Shale policy research has primarily sought to understand variation in state policies, and therefore, tends to minimize the broader similarities among energy producing states. Traditionally, energy policy in the United States, particularly at the state-level, has been understood as a classic example of dominant coalition politics, in which policy formulation and adoption is controlled by a narrow coalition of legislative committees, executive agencies, and industry groups (Eisner, Worsham, and Ringquist 2006; McFarland 1984; Rosenbaum 1987). Also referred to as “iron triangles” or subgovernments, dominant coalition subsystems are believed to direct regulatory policy for fossil fuel extraction in states where these industries contribute significantly to the economy (Davis 1993; Rabe and Mundo 2007).

Research on shale policy remains in its infancy. Most studies have applied case study methods to examine policy conflicts and regulatory policy within one or a few key energy producing states (Cook 2014; Davis 2012; Davis and Hoffer 2012; Dodge and Lee

2017; Heikkila et al. 2014; Rabe 2014; Rabe and Borick 2013; Rahm 2011; Rinfret, Cook, and Pautz 2014; Warner and Shapiro 2013; Weible and Heikkila 2016). However, quantitative methods are increasingly being applied to examine state variations in shale regulations (Davis 2017a; Fisk 2013; Fisk 2013; Fisk, Good, and Nelson 2017; Richardson et al. 2013). Whereas quantitative studies focus on macro-level political and economic factors, case study research considers how contextual factors and the interactions of interests groups and political decision-makers shape shale policies. Both lines of research have failed to consider in detail how the historical significance of extractive industries has led to many practical similarities in the shale policies of energy producing states.

Cook (2014) examined slightly different paths of policy development in three large producer states (Colorado, Louisiana, and Wyoming). These states vary significantly in their political culture, population size, and economic makeup. However, they are similar in that they are all major oil and gas producers. Cook notes that each of these states have traditionally adopted oil and gas policies that favor the industry. While this trend continued following the shale energy boom, these states took somewhat different approaches to the regulation of shale drilling. Louisiana did not develop new regulations for shale drilling, but environmental regulators reported that they were considering the adoption of fracking chemical disclosure rules because other states had done so. In 2010, Wyoming became the first state to adopt a fracking chemical disclosure rule, but did not strengthen other aspects of its oil and gas regulations. Colorado not only imposed fracking disclosure requirements, but also passed legislation to address industry capture of its regulatory agency, protect surface landowners, and increase protection of

wildlife habitats. Cook argues that strong industry presence helped to explain few efforts to regulate fracking in Louisiana. In Wyoming, a desire to preempt federal regulation and the industry's lack of preparedness supported the adoption of a fracking chemical disclosure rule. In Colorado, a greater diversity of stakeholder groups, shifting governing coalitions, and policy entrepreneurship by a democratic governor supported stronger shale regulations (Cook 2014).

Colorado has taken a more environmentally protective path of shale policy development, making it a popular focus of case study researchers (Davis 2012; Heikkila et al. 2014; Kear 2018; Rinfret et al. 2014). Colorado overlays the Niobara-Codell Shale, a tight oil reservoir, which has seen modest development. The state's natural gas boom has largely been driven by another unconventional resource, coal-bed methane (CMB), the development of which also employs high-volume hydraulic fracturing (HVHF) and horizontal drilling. Regardless, natural gas production in Colorado rose significantly during the 2000s, from .75 trillion cubic feet (tcf) in 2000 to 1.58 tcf in 2010. In 2010, the state ranked fifth in natural gas production (U.S. Energy Information Administration 2016). Colorado is major energy producer that also experienced a tremendous boom in unconventional drilling, and therefore, is a relevant case to compare to other shale producing states.

Davis (2012) compared Colorado's response to unconventional drilling with that of Texas. Texas is, by far, the largest natural gas producer in the nation and home to the shale gas revolution. Shale gas drilling was originally perfected within the Barnett Shale in Texas, and the state received significant economic benefits from the subsequent boom in natural gas production. Long a major energy producer, Texas has traditionally favored

the oil and gas industry, and maintained a regulatory regime friendly towards resource extraction. Political decision-makers in Texas have generally held that shale gas drilling is adequately managed under existing regulations for conventional wells. Davis found that, apart from a fracking disclosure rule in 2011, Texas did not adopt new regulations for unconventional wells. In Texas, the economic importance of the oil and gas industry minimized stakeholder conflicts and discouraged more stringent regulations for shale gas drilling.

As previously discussed, a drilling boom led to stronger oil and gas regulations in Colorado. This state is more politically and economically diverse than Texas, and ranchers, retirees, and recreational businesses provided a counter-weight to oil and gas interests. In particular, environmentalists formed an unlikely coalition with conservative property owners forced to relinquish their land to drilling because they did own the mineral rights (Davis 2012). Gatekeeping by regulators also promoted negotiation among opposing parties in Colorado, where representatives from industry and the environmental movement were formally included in the process of drafting regulations (Heikkila et al. 2014; Rinfret et al. 2014). However, perhaps the most important factor was a shift towards democratic control of both the legislative and executive branch in 2006, which created an opportunity for policy change. This was further supported by the election of a governor willing to take the lead in environmental issues.

Shale policy development in Colorado illustrates how strong environmental coalitions, democratic party control, and policy leadership by state governors may combine to support more stringent environmental regulations for oil and gas development. Yet, there is a risk that policy scholars have overstated the extent to which



Colorado departed from a path of policy development that has historically favored the oil and gas industry (Kear 2018). For example, environmental regulation of oil and gas activities remains fragmented between the Colorado Oil and Gas Conservation Commission (COGCC), and the state's Department of Health and Environment (DHEA). Similar institutional patterns are found in other major energy producing states (e.g., Oklahoma, Wyoming, and Texas), and are widely criticized by environmentalists. Like most other states that passed fracking chemical disclosure requirements, Colorado included an exemption for trade secrets that made the rule largely symbolic. Finally, the state has aggressively sought to limit local authority over oil and gas development, and has sued municipalities that attempted to impose local fracking bans (Kear 2018). Overall, shale policy development in Colorado followed a pattern more typical of other major shale producing states in that its regulations did not significantly threaten oil and gas interests. While the state has sought a greater balance between environmental protection and economic development than Texas and Wyoming, it has, nevertheless, protected its position as a major energy producer.

This research compares a "typical" path of shale policy development in Pennsylvania with the "deviant" path observed in New York State. Case studies of shale policies in Colorado, Texas, Wyoming, and Louisiana illustrate the general pattern that characterizes a typical policy path. In these states, as in Pennsylvania, policymakers did not consider UOGD to pose significantly greater risks than conventional drilling. Political decision-makers generally held that HVHF and horizontal drilling were adequately managed under pre-existing regulations. As drilling intensified, environmental issues and land use conflicts increased policy attention to oil and gas regulation. Most major shale

energy producing states adopted relatively modest regulatory reforms that favored the oil and gas industry. For example, while many states adopted fracking chemical disclosure rules, these rules included exemptions for trade secrets that significantly reduced the policy's effectiveness. Shale policy development in New York State deviated from this pattern significantly. In New York, political decision-makers immediately recognized that UOGD posed significantly greater risks than conventional drilling. In 2008, the governor imposed a preemptive moratorium and environmental study to address these risks. After a protracted and contentious environmental review process, New York State banned fracking in 2015.

Compared to other states with significant shale energy resources, New York is distinct in that natural resource extraction was never an economically influential industry. New York had a long history of oil and gas development, but production levels were actually quite low. All other major shale producing states also had some history of coal mining, an industry that was completely absent from New York State. This suggests that historical differences in the importance of natural resource extraction may have played an important role in shaping typical versus deviant paths of shale policy development. I argue that extractive histories leave an economic, political, and cultural imprint on states that supports a favorable policy stance towards the fossil fuel industry. States without such histories may be less subject to industry influence, and more likely to impose stronger environmental regulations.

Analyses of state-level shale policy development generally recognize that the oil and gas industry wields substantial influence in energy producing states. Yet, it offers little insight into why this is the case. Some scholars hypothesize that economic

dependence on natural resource extraction makes states unwilling to challenge the industry (Cook 2014; Davis 2012). However, this idea has largely been untested. Rather, research on the influence of state-level economic factors has focused on the “race to the bottom” thesis using general measures of economic development.

A longstanding argument in the literature on U.S. state environmental policy holds that interstate economic competition places downward pressure on state commitments to environmental protection (Engel 1997; Konisky 2007; Potoski 2001). A strong version of this argument is the “race to the bottom” thesis, which is based on game theory. This theory holds that states have incentives to lower their environmental standards in order to attract mobile capital, and that these incentives combined with the fact that governments may act strategically, may lead to lower standards overall as all states follow a similar logic and impose less stringent regulations in order to gain a competitive advantage (Konisky 2007). A weaker version argues that, while all states may not “race to the bottom”, some states may react to interstate economic competition by minimizing the regulatory costs they impose on industry. Quantitative research on shale policy has incorporated these ideas by considering whether states with lower per capita incomes (Davis 2017a; Fisk 2013), lower state gross domestic products (GDP) (Fisk 2017; Richardson et al. 2013), or high unemployment rates (Fisk 2013) were less likely to impose stronger regulations on shale drilling. These studies find little support for the influence of macro-level economic factors on state shale policies.

Assessments of the “race to the bottom” thesis fail to account for the ways in which historical patterns of resource extraction likely played into policymakers’ assessments of competitive advantage. General measures of a state’s economic

performance were probably not as significant for shale policy decisions than the relative gains that might be expected from fossil fuel extraction. Placing assessments of competitive advantage in historical context may help explain why energy companies remained influential in states like Pennsylvania where fossil fuel extraction was no longer a significant contributor to employment or gross domestic product. In Pennsylvania, the historical importance of the coal industry and the state's early role in the emergence of the oil and gas industry signaled to policymakers the potential for significant economic gains from shale gas development. In states without a history of natural resource extraction, like New York, policymakers' perceptions of the benefits of UOGD were likely tempered by perceptions of the environmental risks and threats to competing industries that the industry posed. The following chapters will explore the extent to which typical and deviant patterns of shale policy development are path dependent. To the extent that they are, this suggests a revision of the "race to the bottom" thesis to incorporate the historical influence of the particular industries subject to environmental regulation.

While the historical influence of extractive industries arguably shapes shale policies at the state-level, case studies of shale policy development in Colorado suggest that macro-level political dynamics are also an important factor. Rabe (2014) argues that increasing partisan polarization helps to explain variability in state shale policies as strong-Republican and strong-Democratic states adopt divergent approaches to shale governance issues. In recent years, state politics appear to have shifted away from a pattern of divided control of the executive and legislative branches towards increasing partisan polarization (Kurtz 2013). Democratic party control is generally considered to be

more favorable for environmental interests. However, in the past, divided party control “fostered greater commitment to environmental protection and some policy innovation, as competitive political parties engaged in political bidding to demonstrate environmental credentials amid an increasingly environmentally conscious electorate” (Rabe 2014: 8372). Currently, the overall trend is towards increasing partisan polarization. At the same time, environmental public opinion has also become more divided along party lines (Kim and Urpelainen 2018). Indeed, public opinion research finds partisanship to be a strong predictor of risk perceptions and policy preferences towards shale energy, with Republicans generally more supportive of shale drilling than Democrats (Brown et al. 2013; Xian, Hearn, and Miller 2012). Therefore, we might expect state divergence in shale policies to be driven by party politics with strong-Democratic states pursuing more stringent environmental regulations, while strong-Republican states revert to traditional approaches that prioritize economic development.

While case studies suggest that partisan politics play a role in shale policy decisions, quantitative studies of regulatory heterogeneity are mixed. Fisk et al. (2017) found that public support for environmental protection and higher state liberalism were positively associated with the stringency of state oil and gas regulations for 27 producer states. By contrast, Richardson et al. (2013) found that regulatory heterogeneity among oil and gas producing states was not associated with political variables. However, the stringency index used in both studies was a general measure of oil and gas regulations, not an indicator of action or inaction on the risks of shale drilling in particular. Fisk (2013) did look specifically at shale policy (i.e., the adoption of fracking chemical disclosure rules) but did not find political leadership or the predominant political

ideology of a state's citizenry to be associated with policy adoption. Davis (2017a) examined a mixture of fracking specific and general oil and gas regulations, and observed that a higher percentage of conservative voters was associated with less protective measures.

One major drawback of the quantitative research on partisanship is that it is largely incapable of capturing the ways in which historical context, interest group mobilization, and contingent events and strategic actions shape policy development. While shifts towards democratic governing coalitions may offer increased opportunities for environmental regulation, these opportunities likely remain limited in states where extractive industries are politically influential. Even in states with weaker energy lobbies, such political opportunities may only be realized in conjunction with sympathetic and proactive political elites. For example, in Pennsylvania, democratic Governor Ed Rendell was an enthusiastic supporter of the Marcellus Shale gas boom. While Governor Rendell recognized some environmental issues associated with the rapid expansion of intensive oil and gas development, he lacked the political will to challenge a historically powerful energy lobby. The oil and gas industry lacked political influence in New York, a fact that no doubt increased opportunities for more aggressive environmental regulation. However, the strategic actions of two successive democratic governors (David Paterson and Andrew Cuomo) significantly shaped the trajectory of shale policy in New York State. Governor Paterson's fracking moratorium and Governor Cuomo's fracking ban did not take place in a vacuum, but rather, occurred within a context of intense anti-fracking mobilization.

Few studies of state-level shale policies consider the historical context of political decision-making or the path dependence of policy decisions. I argue that alternative histories of natural resource extraction may place states on distinct trajectories of shale policy development. While these policy paths are determinative to some extent, particular policy trajectories reflect a combination of factors that include history, economic and political structures, trends in political partisanship, interest group mobilization, and contingent events and strategic actions. This dissertation adopts path dependency as a general theoretical framework for understanding shale policy divergence in New York and Pennsylvania. The next sections describe this research approach, and outline the basic features of a carbon dependent path in Pennsylvania and an environmental preservation path in New York.

## THEORETICAL FRAMEWORK AND RESEARCH APPROACH

The concept of path dependence has various meanings within the social sciences. The dominant approach is associated with institutional theory in economics and political science. This tradition makes strong theoretical claims, and commonly characterizes path dependence as “those historical sequences in which contingent events set into motion institutional patterns or event chains that have deterministic properties” (Mahoney 2000: 507). Path dependency is often further specified as involving self-reinforcing mechanisms or a process of increasing returns (Arthur 1989; Pierson 2000, 2011). An alternative approach makes fewer assumptions about the structure of path dependent

sequences or the particular mechanisms that cause them. Such perspectives, often termed “weak” or “soft”, begin with the uncontroversial idea that historical event sequences shape how future events unfold. It is often suggested that, what I call, a “minimalist” approach to path dependency does little more than restate the obvious fact that “the past influences the future.” I argue that minimal path dependency theories are actually more involved than this, and in many cases, are a more suitable form of historical explanation. Strong versions of path dependence face their own set of criticisms. I briefly describe common features of strong path dependency theories and highlight some potential drawbacks to this approach. Then, I consider efforts to develop the idea of reiterated problem solving as an alternative. I argue that path dependence is a more powerful metaphor, and that a less restrictive conceptualization should be retained. I conclude this section by elaborating a minimalist approach to path dependence.

The dominant “strong” approach to path dependence is rooted in a critique of traditional efficiency arguments in economics and political science. This thread of path dependency theory can be traced to the work of Paul David (1985) and Brian Arthur (1989) who argued that, by ignoring the historical and institutional context of “rational action,” neoclassical economic theory failed to account for situations in which increasing returns produce inefficiencies and suboptimal allocations of resources that persist overtime. These ideas have been taken up by institutionalist scholars who study politics and policy to argue that policy development is often shaped by path dependent processes. Such applications of path dependence are less concerned with questions of efficiency, and more interested in understanding how political institutions endure overtime and constrain future policy development. For example, strong path dependency narratives are



often used in comparative historical analysis to explain national differences in social welfare and economic policies (Esping-Andersen 1990; Pierson 1994; Skocpol 1992). For example, Hacker (1998) argues that differences in political and market institutions contributed to the initial divergence of public health provision policies in Britain, Canada, and the United States. Hacker employs the notion of path dependence to describe how these policy differences were reinforced overtime as institutional inertia, party politics, and policy feedback constrained opportunities for policy change.

While strong path dependency arguments incorporate multi-causality and policy actors' strategic interactions, institutions – whether these be formal rules, policy structures, or norms – are seen as the central factors shaping a trajectory of policy development. Furthermore, causal force is specifically attributed to institutional factors brought into play by “critical junctures” (Mahoney 2000; Pierson 2004). This has led to the criticism that, by emphasizing the contingency of historical switch points, strong path dependency approaches obscure how social change is often deeply tied to past legacies and the mobilization of social actors (Haydu 1998; Howlett 2009). Strong path dependency arguments also emphasize institutional stability and incremental change, and therefore, offer less insight to moments of institutional transformation. Generally, the emergence of developmental pathways is explained by processes set in motion by contingent events that occur at crucial founding moments (Thelen 1999; Mahoney 2000; Pierson 2000). Yet, this often leaves little room for agency or the possibility that multiple, and possibly contradictory, casual trajectories may be operative within an episode. A focus on critical junctures also fails to recognize that dramatic institutional

change may occur through the “layering” of incremental changes overtime (Thelen 2003).

### *Reiterated Problem Solving*

Some scholars have proposed “reiterated problem solving” or “process sequencing” as an alternative to path dependency (Haydu 1998; Howlett 2009). Process sequencing emphasizes how trajectories of policy development are shaped by embedded “crises” rather than random critical junctures. Haydu (1998) originally developed the concept of reiterated problem solving to address a methodological problem created by the use of critical junctures to define historical periods within path dependency models. Haydu argued that reliance on critical junctures created an artificial discontinuity between time periods that restricts historical comparison. Whereas path dependency models require a break in historical causation at the onset of a new trajectory (Mahoney 2000), process sequencing models presuppose multiple causal trajectories with varying temporal rhythms and consider how they are brought together within the context of reoccurring dilemmas (Haydu 2010).

There is much to commend a reiterated problem solving approach. In particular, it highlights a wider range of historical influences than typically found in path dependency theory, including positive feedback following chance events, as well as, those related to enduring cultural and structural continuities, social learning, balance of power shifts, and the mobilization of collective actors. However, like strong path dependency theories, this approach also unnecessarily imposes a particular structure to historically determined

sequences. Haydu relies upon the idea of embedded contradictions or recurring dilemmas to provide continuity to event sequences with multiple turning points. Yet, one cannot assume that, for a particular historical individual, transitions between trajectories repeatedly turn on the same type of crisis or dilemma (Abbott 1997). Rather, the continuity or cohesiveness of a linked set of trajectories is more generally found in the character of the historical individual (i.e., its identity or quasi-permanent set of related attributes) (Patterson 2004).

While I agree with the criticisms of strong path dependency theories offered by Haydu and others, I believe that it would be unwise to relinquish such a powerful metaphor as path dependence. The more nomothetically inclined branch of social science does not have exclusive rights to this idea, although it would be easy to assume so given the preponderance of discussions that dismiss minimalist definitions as historical common sense or mundane historicism (Djelic and Quack 2007; Howlett 2009; Haydu 1998; Mahoney 2000; Pierson 2011; Thelen 2003). Nevertheless, even James Mahoney, who is a major proponent of a more “scientific” historical sociology, has recognized that weak conceptualizations of path dependence are a legitimate choice for scholars who are concerned with a wider range of temporal concepts and ideas (Mahoney and Schensul 2006). For example, in an effort to strengthen the theoretical foundations of historical sociology, Sewell (2005) combines a weak notion of path dependence with assumptions of temporally heterogeneous causalities and global contingency to formulate an “eventful conceptualization of temporality.” Similarly, Tilly (2006) joins a minimal concept of path dependence with a variety of other ideas to illustrate the importance of a historical approach to political analysis. Such “weak” path dependency theories assume that a

multiplicity of factors propel a historical individual along a particular pathway, and offer greater flexibility in the construction of path dependent sequences.

### *A Minimalist Approach*

A minimalist approach to path dependence does not make strong theoretical claims about the causal mechanisms that produce a historically determined sequence of events. Yet, there is more to a minimal approach than the claim that “history matters.” In *Democracy in the Making*, Kathleen M. Blee (2012) elaborates an approach to path dependence that could be described as “minimalist,” although she does not employ this term. Blee identifies five properties of path dependent sequences that structure the analysis of path dependency without imposing unnecessary assumptions about the centrality of self-reinforcing mechanisms, inertia, or initial events. A discussion of these five properties serves to frame the analyses contained in this chapter and the chapters that follow.

First, path dependent sequences are constituted by event cascades that shape options for later action. This is the central idea contained in the often quoted passage from Sewell that “what happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time” (Sewell 2005: 100). Blee uses a study by Harvey Molotch, William Freudenburg, and Krista E. Paulsen (2000) of economic development in Ventura and Santa Barbara, California to illustrate the idea of event cascades. Ventura and Santa Barbara are both coastal cities and seats of county government that are located near oil reserves. Although the populations and

socioeconomic characteristics of these cities were quite similar, they followed different paths of economic development. In Ventura, oil and gas development was poorly managed by local officials resulting in a marred landscape that foreclosed possibilities for upscale housing and recreational development along its waterfront. By contrast, citizens groups in Santa Barbara pressured local decision-makers to utilize oil tax revenues to improve the waterfront district, which attracted educational institutions, and upscale businesses and residents to the area. As a result of distinct event cascades, Santa Barbara emerged as an innovation and technology hub, while Ventura became a dismal industrial seaport with an uninspiring cultural scene and little land-use planning.

A second feature of path dependent sequences is that “options for action are increasingly constrained but always contingent” (Blee 2012: 36). This is a corollary of event cascades since previous patterns of occurrences will narrow the future possible choices of actors. Once particular paths of action are set upon, they are more likely to continue. Yet, there is always the possibility that new events and unexpected decisions may change a given trajectory.

Given that chance and human agency are fundamental features of the social world, path dependent sequences display both durability and dynamism. The third attribute of path dependence means that, while the past influences the future, events are always new and unfolding. Event cascades have emergent properties that result in a “rolling inertia [that] allows for continuous flux within a stable mode of operation” (Molotch et al. 2000: 819).

A fourth property of path dependent sequences is that timing matters. The order of events can have significant consequences for how a sequence of events unfolds. In

particular, early events in a sequence, even seemingly minor occurrences, can have tremendous consequences. However, this does not mean that causal factors occur only at the beginning of a sequence. Rather, “chains of cause and effect can occur throughout a pathway, set in motion by unfolding structures and the sequential choice of social actors” (Blee 2012: 37).

Finally, in path dependent sequences, historical influence runs deep. This fifth feature refers to the fact that patterns of events from the distant past may leave a lasting imprint on the structure of social life.

The contingency of action, the emergent nature of event cascades, and the combination of durability and dynamism implies that path dependence is produced by a multiplicity of factors that occur as sequences of events unfold overtime. An understanding of how “history matters” is achieved through the thick description of these sequences, rather than the identification of a primary factor or set of factors. A minimalist approach to path dependence is particularly useful when one is not looking for general mechanisms, but is interested in describing how broad historical patterns shape the unfolding of particular trajectories. Thus, path dependence provides a metaphor that aides in the ordering of events and actions in such a way that renders phenomena intelligible. Following Kay, “a metaphor can help improve a policy story by providing reasons” (2005: 565). It is in this sense that I use path dependence to provide a rationale and an explanatory context for action.

This study applies these ideas to understand shale policy divergence in New York and Pennsylvania. I argue that a path of carbon dependence in Pennsylvania, and a path of environmental preservation in New York led to fundamentally different contexts of

environmental mobilization and political decision-making. Trends in political partisanship, interest group mobilization, contingent events and particular strategic actions, came together to produce distinct policy trajectories in these states. By describing these factors against the backdrop of each state's extractive and environmental history, the overall logic of each state's policy trajectory is revealed.

## CARBON DEPENDENCE IN PENNSYLVANIA

This research will show that Pennsylvania followed a carbon dependent path of shale policy development that emphasized intensive extraction of fossil fuels over environmental protection. This path was rooted in the state's historical dependence on natural resource extraction, and coal mining in particular. I argue that the historical importance of coal mining had an enduring effect on Pennsylvania's political economy, culture, and environment, one that lasted even as the industry declined in economic importance during the later half of the twentieth century.

In recent decades, coal mining has contributed minimally to Pennsylvania's total employment and gross domestic product. Nevertheless, the energy industry remains an influential player in Pennsylvania politics. Pennsylvania is still the third-largest coal-producing state, and one of the top-three electricity producing states in the nation, and an important electricity supplier to the Mid-Atlantic region (U.S. Energy Information Administration 2017b). Previous research highlights the political influence of Pennsylvania's energy industry. For example, Pennsylvania adopted a Renewable Portfolio Standard (RPS) in 2004 under democratic Governor Ed Rendell, which made

substantial concessions to the industry by classifying coalmine methane, waste coal, and integrated coal gasification as qualifying sources (Rabe 2007). This expansive definition of eligible energy sources was highly controversial and led state-based environmental groups to label the proposal “the dirtiest RPS” in the nation. The Marcellus Shale gas boom, which made Pennsylvania the nation’s second-largest natural gas-producing state, further consolidated Pennsylvania’s position as a major energy supplier (U.S. Energy Information Administration 2017b). Since 2011, developers have proposed over 40 natural gas-fired power plants in Pennsylvania (Downing 2017).

The historical importance of the energy industry within Pennsylvania certainly shaped the policy framings and political calculations of policymakers when it came to shale drilling and fracking. The Marcellus Shale gas boom emerged at a time when the state faced major economic challenges and budgetary shortfalls. Within this context, the shale energy boom was easily framed as an opportunity to expand existing industries and improve the state’s economy. Furthermore, shale drilling was also portrayed as less destructive than conventional drilling and coal mining. Natural gas, which emits less carbon when burned than other fuels, was also presented as a means to fight climate change. For political decision-makers familiar with the environmental and economic devastation caused by coal mining, oil and gas development likely seemed relatively benign in comparison. Even when controversies over fracking emerged, policymakers who may have been sympathetic to environmentalists’ concerns would have had to weigh the political risks of challenging such a powerful industry. In particular, lawmakers from rural counties, where many viewed shale drilling favorably, had little incentive to pursue policies that threatened the industry.



Pennsylvania's legacy of natural resource extraction supported a policy environment that was deferential towards the oil and gas industry. It also presented barriers to the emergence of an anti-fracking movement, which might have offered some countervailing pressure. Research suggests that local residents in states with a history and culture of natural resource extraction tend to hold more favorable views of such industries (Freudenburg and Gramling 1994; Gullion 2015; Jerolmack and Walker). Communities that are familiar with extractive industries and that receive substantial economic benefits from them may be more willing to accept the environmental risks that such industries entail. This is particularly true in regions where historical dependence on coal mining devastated the environment and impeded economic development. The fact that community opposition to fracking was relatively weak in Pennsylvania lends support to these ideas.

There is also evidence to suggest that the positions of professional environmental advocacy organizations (EAOs) in Pennsylvania were also shaped by the state's more carbon dependent past. PennFuture, the Pennsylvania Sierra Club, and the Pennsylvania Lands Trust gave testimony supporting the Marcellus Shale gas boom at hearings held by the Pennsylvania House of Representatives' Environmental Resources and Energy Committee in 2009. Later chapters will show that these organizations offered weak challenges to the policy status quo, and at least initially, were more interested in a severance tax on drilling than the passage of more stringent environmental regulations. I argue that the historical influence of the energy industry limited the political opportunities of environmentalists, a fact which seems to have influenced the strategies of the state's most important EAOs.

The influence of energy companies and weak opposition to fracking combined with the timing of shale gas development and trends in political partisanship to reinforce a path of carbon dependence in Pennsylvania. Shale gas drilling was well underway by the time that concerns over fracking became widely publicized. There is evidence that this created additional barriers to mobilization. As one organizer from PennEnvironment whom I interviewed in Philadelphia in 2013 put it, “It’s easier to say, no, we are not going to let you into this area, than to say, you are already there, but we are going to kick you out. So, there isn’t that much excitement.” Activists’ political opportunities were also limited by a shift towards Republican Party control in 2011. The following chapters will describe in greater detail how, in Pennsylvania, a history of natural resource extraction combined with Republican Party control, weak environmental mobilization, and a series of contingent events and strategic actions by key policymakers came together to produce shale policies that favored industry.

## ENVIRONMENTAL PRESERVATION IN NEW YORK

Although New York played an important role in the early emergence of the oil and gas industry, natural resource extraction had limited influence on this state’s political and economic development. Oil and gas development is a very small industry in New York State, and geographically limited to only a few counties. Coal mining has not occurred there, and while other forms of mineral mining (e.g., sand, gravel, and limestone) are prevalent, the environmental footprint and economic contribution of these

industries are small. The relative absence of extractive industries in New York likely led local residents and political decision-makers to be more cautious about the expansion of a new technology (fracking) with uncertain and contested environmental risks. While New York policymakers initially greeted the Marcellus Shale gas boom favorably, many adopted more precautionary positions once public concerns over shale drilling and fracking arose.

I argue that the historical weakness of extractive and energy industries in New York State combined with unique features of the state's rural economy and urban-rural relations to support a trajectory of shale policy development that favored environmentalists over oil and gas interests. I consider how these factors shaped the social construction of risk, supported the emergence of a popular anti-fracking movement, and influenced the political calculations of decision-makers.

Although many rural communities in Upstate New York suffer from a lack of economic opportunity, the region benefits from relatively pristine rivers, lakes, and mountains. The absence of extractive industries has saved these natural areas from environmental devastation and favored the development of a healthy tourism industry. In particular, New York's Southern Tier is known for its wineries, and the Catskill region is a popular vacation spot for people looking to escape New York City. It is common for the wealthy to have vacation homes in both of these areas. These are also popular destinations for retirees and urban dwellers looking to relocate to more rural communities. The appearance of landmen seeking to buy oil and gas rights within these areas was an unwelcome surprise to many local residents. Oil and gas companies began exploring the possibility of drilling within New York's Marcellus Shale after drilling had

commenced in Pennsylvania. Some Upstate New Yorkers who looked at the impact of shale drilling and fracking in Pennsylvania and in the Texas Barnett Shale raised concerns over the threats that the industry posed to the environment and local quality of life. Although some landowners saw shale drilling as an economic opportunity, many local residents within New York's Marcellus Shale felt they had more to lose than to gain from natural gas development. Widespread media attention to the risks of fracking, spurred in part by the movie *Gasland*, helped to solidify these fears, and contributed to local anti-fracking mobilizations and campaigns for municipal fracking bans.

Importantly, shale gas drilling and fracking in New York was socially constructed as an environmental risk not only for residents within the Marcellus Shale, but for those living in New York City as well. New York City (NYC) has the largest unfiltered water supply in the United States, which is partly derived from the Catskill/Delaware watershed. The potential for Marcellus Shale drilling within this watershed brought increased attention to fracking and contributed to oppositional mobilization by professional and grassroots environmental organizations, political officials, and celebrities from NYC. As a result, a statewide anti-fracking movement emerged in New York that was capable of placing substantial pressure on political decision-makers.

It is difficult to imagine New York imposing a fracking ban in the absence of its widespread environmental mobilization. However, other circumstances also facilitated Governor Andrew Cuomo's decision to prohibit shale gas drilling in New York State. This decision is striking because state policies typically favor economic development, and so, tend to side with business interests. However, scholars have long noted that the federal system creates incentives for states to export pollution (Gormley 1987; Lowry

1992). Policymakers may be willing to pursue environmental policies that business interests oppose if costs can be exported to other jurisdictions and benefits gained internally (Rabe and Mundo 2007). New York's fracking ban can be fruitfully understood in this light. Given its large population, New York State has one of the highest energy consumption rates in the nation. However, more than half of New York's energy is supplied by other states and Canada (U.S. Energy Information Administration 2017a). Indeed, as a result of the Marcellus Shale gas boom, New York increasingly receives much of its natural gas from Pennsylvania. The imposition of a fracking ban allowed New York to avoid the costs of shale gas development, while the region's pipeline infrastructure ensured that the state continued to benefit from the abundant shale gas resources of its neighbor to the south.

This dissertation describes how the lack of an extractive history combined with Democratic Party control, strong environmental mobilization, and a series of contingent events and strategic actions by key policymakers came together to produce favorable shale policies in New York. The following chapters will contrast these conditions with those in Pennsylvania and illustrate how path dependence led to divergent trajectories of shale policy development within each state. The final section of this chapter provides a plan of the dissertation that outlines how this will be done in greater detail. But first, I offer a brief introduction to the Marcellus Shale gas boom that places events within these states within the context of broader trends in domestic and regional oil and gas development.

## PUTTING THE MARCELLUS SHALE GAS BOOM IN CONTEXT

The Marcellus Shale gas boom emerged from a wave of prospecting that began in the early 2000s, which was sparked by rising oil and gas prices and advancements in technology. This context is important for understanding initial responses to the shale gas boom. Concerns over increasing natural gas prices and natural gas shortages led most lawmakers in New York and Pennsylvania to support increased natural gas development. At the beginning of the shale gas boom, oil and gas policy in these states was shaped by a pattern of dominant coalition politics, in which a narrow coalition of legislative committees, executive agencies, and industry groups oversaw policy formulation and adoption. The introduction of new shale drilling technologies, and subsequent political controversies over fracking, increased lawmakers' attention to oil and gas policy, and created opportunities to challenge this arrangement. A brief discussion of how the policy status quo was disrupted in New York, but maintained in Pennsylvania introduces the core research problem motivating this study.

During most of 1990s, low natural gas prices constrained domestic productive capacity as lower returns on investment discouraged new well development. At the same time, lower prices contributed to increased natural gas consumption. Together these factors created a tight supply situation that culminated in 2000 when strong economic growth and higher heating and cooling loads served by natural gas led to escalating prices and shortages (U.S. Energy Information Administration 2001). This helped to stimulate increased natural gas drilling, and encouraged exploration in new fields. Prior to the Marcellus Shale gas boom, oil and gas E&P had already begun to increase in New York

and Pennsylvania as part of this broader trend. Renewed drilling in these states initially focused on the Trenton Black-River formation. Development of this natural gas reservoir actually began in 1996, but received greater attention towards the end of the decade as natural gas markets tightened (Patchen et al. 2006). Successful production in this field led to a small natural gas boom, which paled in comparison to the Marcellus Shale, but nevertheless signaled the revival of an industry previously in decline.

The natural gas supply shortage and developments in the Trenton Black-River formation during the early 2000s are relevant to this research because they provide some insight to the “rules of the game” governing oil and gas policy in New York and Pennsylvania prior to the shale energy revolution. Given concerns over the price and supply of natural gas, political decision-makers largely greeted increased oil and gas E&P favorably. For example, the Pennsylvania House of Representatives passed a resolution on November 26, 2002 (H.R. 630) explicitly calling for the promotion of natural gas development within the Trenton Black-River formation. While the New York State Legislature did not formally express support for increased oil and gas E&P, legislative attention to the topic prioritized the economic development of oil and gas. State support of the industry was also observed in the leasing of state lands. In New York and Pennsylvania, drilling within the Trenton Black-River reservoir led to major state lease sales, which contributed significantly to state revenue. While state leasing drew criticism from environmentalists, environmental advocacy groups were largely absent from state policy fields prior to the Marcellus Shale gas boom. This dissertation will show that each state’s oil and gas policy field was largely the domain of policy experts who shared a relatively favorable view of the industry. Environmental concerns over drilling did not

become a major issue until after the Marcellus Shale gas boom when contention over “fracking” shattered this policy consensus.

Although the Trenton Black-River and Marcellus Shale were two very different natural gas reservoirs, they were similar in that they occurred as a result of advances in technology and investments by large-scale oil and gas operators. Both involved drilling “deep” wells with vertical depths of anywhere from 5,000 to 10,000 feet, and experimentation with horizontal drilling technologies. Reporting on the drilling within the Trenton Black-River reservoir, the New York State Energy Research and Development Authority (NYSERDA) noted that it was “a high-tech, high-risk enterprise that [required] accurate interpretation of 2-D and 3-D seismic imaging data, drilling of deviated or horizontal wells in some areas, and integration of seismic, well logs and geologic and geochemical data into a sophisticated exploration and development model” (2007: 23). Much the same could be said for oil and gas development within the Marcellus Shale. Such efforts were out of the realm of smaller conventional oil and gas operators who previously contributed the bulk of new well development within New York and Pennsylvania. As early as 1998, the New York State Department of Environmental Conservation (NYSDEC) recognized that with development of the Trenton Black-River formation “traditional oil and gas producers in NYS [had] been joined by a new group of larger-sized and more highly capitalized companies” (NYSDEC 1998: ii). The Marcellus Shale gas boom would accelerate the entry of major corporate players into New York and Pennsylvania’s oil and gas fields.

The Marcellus Shale gas boom was made possible by improvements to well drilling and stimulation technologies that occurred in Texas during the late 1990s and



early 2000s. Commercial shale gas extraction was first achieved by engineers at Mitchell Energy in the Barnett Shale in Texas in 1998 using a combination of slick water high-volume hydraulic fracturing (HVHF) and horizontal drilling (Steward 2007; Trembath, Jenkins, Nordhaus, and Shellenberger 2012). However, low natural gas prices at the time prohibited additional test well development. In 2002, Mitchell Energy merged with Devon Energy, one of the largest independent oil and gas operators in North America. With improved market conditions and strong financial footing, Devon Energy moved forward with horizontal drilling in the Barnett Shale in 2002. Word traveled fast, and by 2003, twenty-five other operators also applied for horizontal well permits in the region (Wang and Krupnick 2013). Shale energy development quickly spread to other prospective oil and gas fields throughout the United States: the Fayetteville Shale in Arkansas and Oklahoma (2003), the Marcellus Shale in Pennsylvania (2004), the Bakken Shale in North Dakota and Wyoming (2005), the Haynesville Shale in Louisiana and Texas (2006), and the Eagle Ford Shale in Texas (2008) (Breyer 2012). The shale energy revolution was born.

In 2004, Range Resources completed the first successful Marcellus Shale well (Renz #1) in Washington County, Pennsylvania (Harper 2008). Throughout 2006 and 2007, increased gas leasing within the Marcellus Shale region signaled that an impending gas boom was on the horizon. However, it was not until Range Resources released production results towards the end of 2007 that this activity received much attention (Wilber 2012). By 2008, the Marcellus Shale gas boom was in full swing, and receiving closer scrutiny from the press, local stakeholders, and political decision-makers. While many considered the shale gas boom to be a tremendous economic opportunity, others

raised concerns over the potential environmental and public health impacts of shale drilling. In the spring of 2008, informational sessions on gas leasing sponsored by state and local agencies were drawing huge crowds throughout Pennsylvania, and in New York's Southern Tier. By this time, ad hoc community-based action groups, such as Damascus Citizens for Sustainability, were sponsoring their own informational meetings, which focused on the negative impacts of shale energy development. The technological risks of HVHF or fracking were a particular focus of concern, and triggered New York State Governor David Paterson's decision on July 27, 2008 to order an environmental review of the practice. With this decision, a *de facto* moratorium on shale drilling was imposed, and New York State's Marcellus Shale gas boom effectively ended before it had even begun.

The moratorium and environmental review process set the stage for shale policy divergence between New York and Pennsylvania. In Pennsylvania, shale policy development occurred through a relatively standard process involving the formulation of legislative proposals, the enactment of legislation (i.e., Act 13 of 2012), and promulgation of regulations in 2016 (46 Pa. Bull. 6431). The end result was shale policy that combined relatively modest revisions to environmental regulations with a more significant introduction of a natural gas "impact fee" in lieu of a severance tax. Overall, the shale policy adopted by Pennsylvania preserved the traditional policy status quo, which was preferential towards the economic development of oil and gas. By contrast, shale policy development in New York State was unique in that it primarily occurred through an administrative process involving an environmental impact statement (EIS) and final determination made by the NYSDEC. Actions by the New York State Legislature

helped to reinforce a realignment of the oil and gas policy SAF in support of environmental interests. However, the NYSDEC was responsible for the formal adoption of the state's final policy on shale drilling. Between 2008 and 2015, the NYSDEC oversaw an intensive study of the negative environmental and public health impacts of fracking and concluded that its environmental risks outweighed its potential economic benefits. With this decision, shale drilling was effectively banned in New York State.

Prior to the Marcellus Shale gas boom, the policy status quo in both New York and Pennsylvania was supportive of oil and gas development. However, I argue that the strength of this status quo was much weaker in New York than in Pennsylvania, and that this weakness derived from the fact that extractive industries were never an important part of this state's economy. In New York, oil and gas interests were small in comparison to those who viewed fracking as an economic and environmental threat. By contrast, the policy status quo in Pennsylvania was rooted in this state's historical role as a major energy producer. In Pennsylvania, the entrenched interests of energy companies were much more difficult to shake.

## PLAN OF THE DISSERTATION

Chapter Two describes enduring state differences in natural resource extraction, political and economic structures, and oil and gas policy. I examine historical data on oil and gas development and the economic influence of extractive industries, which shows clear differences in the basis of industry influence in New York and Pennsylvania. I provide a brief history of oil and gas policy development in these states and consider

similarities in oil and gas regulations prior to the Marcellus Shale gas boom. I address challenges that these similarities pose to the claim that path dependence accounts for shale policy divergence. I argue that these similarities are superficial and obscure deeper differences in the importance and influence of extractive industries in these states.

Chapter Three describes early environmental mobilization opposing shale gas development and traces differential trajectories of anti-fracking mobilization and movement outcomes in New York and Pennsylvania. I utilize data on the founding of grassroots anti-fracking organizations and local fracking bans to show that environmental interests were significantly more powerful in New York than in Pennsylvania. This chapter also considers professional environmental advocacy in each state, and uses personal interviews and testimony on legislative hearings to highlight the synergy between grassroots and professional mobilization in New York, and the lack of effective coordination in Pennsylvania. I argue that a weak anti-fracking movement in Pennsylvania offered little challenge to the status quo, while strong grassroots opposition combined with effective professional environmental advocacy led many political decision-makers in New York to favor a fracking ban.

Chapter Four considers shale policy development in New York and Pennsylvania before and after the politicization of the Marcellus Shale gas boom. I utilize oil and gas bill introductions and legislative hearing testimony to show the strength of energy interests in Pennsylvania, and their relative weakness in New York. I describe how pre- and post-boom legislative attention and policy change provides evidence of a carbon dependent path of shale policy development in Pennsylvania, and an environmental preservation path in New York. This chapter also examines state congressional and

executive party control and stances towards UOG development, and trends in political polarization to make a case for path dependence.

Chapter Five will summarize the findings from each of the preceding chapters, and provides a coherent narrative for how historical differences in natural resource extraction and political and economic structures, trends in political partisanship, social movement mobilization, and contingent events and strategic action led to distinct shale policy outcome in New York and Pennsylvania.

## CHAPTER TWO

### THE POLITICAL AND ECONOMIC FOUNDATIONS OF SHALE POLICY PATH DEPENDENCE

Different histories of natural resource extraction and urban influence placed New York and Pennsylvania on distinct paths of shale policy development. A legacy of coal mining supported a carbon dependent path in Pennsylvania, while the relative absence of extractive industries and the interests of New York City elites encouraged an environmental preservation path in New York. Historical differences in oil and gas production and policy development were also significant for how shale policy unfolded in New York and Pennsylvania. This chapter lays the foundation for analyses contained in Chapter Three and Chapter Four by illustrating how differences in fossil fuel production and urban influence contributed to enduring differences in these states' political and economic structures. A comparison of key social and economic characteristics and employment by industry shows that these historical factors led to persistent differences between New York and Pennsylvania. A review of historical natural resource management policies further illustrates a pattern of carbon dependence in Pennsylvania and environmental preservation in New York. These broad historical patterns provide an important backdrop for understanding shale policy development in each state.

Policymakers in New York and Pennsylvania responded to the Marcellus Shale gas boom in dramatically different ways. In Pennsylvania, decision-makers implemented stronger regulations only after environmental issues surfaced and the risks of unconventional drilling received public attention. In New York, successive governors

enacted a preemptive moratorium on high-volume hydraulic fracturing (HVHF) in 2008, and oversaw a comprehensive environmental review, which resulted in a fracking ban in 2015. I argue that a minimalist approach to path dependence is most appropriate for understanding how differences in resource extraction and urban influence led to this divergence. Unlike strong path dependency theories, which use “self-reinforcing processes” to explain historical continuities, a minimalist approach makes fewer assumptions about the structure of path dependent sequences or the mechanisms that cause them. Minimal path dependency theories begin with a basic assumption that historical patterns (e.g., of action, social relations, and meaning) constrain those that occur in the future, but then allow for greater flexibility in how multiple causal factors come together to produce a given outcome. This chapter illustrates how a minimalist approach to path dependence applies to these cases.

Across the United States, the shale energy boom and the political contention that it engendered brought new attention to the environmental regulation of oil and gas exploration and production (E&P). Public controversies over fracking, in particular, highlighted the central role that state governments play in providing environmental oversight for oil and gas operations. Outside of offshore drilling and federal lands, the states are the primary regulators of oil and gas development. Therefore, it is important to understand the factors that shape state approaches to unconventional drilling and fracking. In almost all energy producing states, unconventional drilling was initially perceived to carry similar risks as conventional oil and gas exploration and production (E&P). Existing regulations were considered sufficient, and modified slightly only after

public concerns over fracking emerged. New York State was unique in taking a precautionary approach to regulation.

New York is one of the few states with major shale resources that did not also have a history of natural resource extraction. In most major shale producing states, natural resource extraction has historically been an economically influential industry. Previous research finds that extractive industries may have lasting economic, political, and cultural influences on the regions in which they are located (Bunker 1984; Freudenburg and Gramling 1994; Gaventa 1982). I argue that historical differences in the importance of natural resource extraction led to distinct trajectories of shale policy development in New York and Pennsylvania. Throughout the 19<sup>th</sup> and early 20<sup>th</sup> century, Pennsylvania was a major producer of coal, and oil and natural gas. While the economic importance of extractive industries declined in Pennsylvania during the later half of the 20<sup>th</sup> century, they nevertheless left an environmental and political legacy that continued to impact the state. Although New York contributed to the early emergence of the oil and gas industry, energy production was never central to this state's economy. As a result, New York retained a relatively pristine rural environment that the state's liberal urban elite would develop an interest in maintaining.

Shale regulation and the politics of shale energy, more generally, have attracted substantial attention from scholars concerned with the framing of environmental risk, the challenges of environmental governance, and the problems of regulatory capture (Davis and Hoffer 2012; Dodge and Lee 2017; Rabe and Borick 2013; Rabe 2014). Comparative research finds substantial state variation in shale policy dynamics and the regulation of shale energy E&P (Cook 2014; Davis 2012; Krupnick, Richardson, and Gottlieb 2015;



Weible and Heikkila 2016). This research has not only expanded our understanding of the political conflicts surrounding shale energy and fracking, but also contributed more broadly to knowledge about the policy process. However, most studies have provided a “snapshot” view that largely fails to consider the historical context of contemporary events. Policy scholars have increasingly emphasized the importance of historical change processes and the need to situate policy events within a temporal sequence stretching over extended periods (Capano 2009; Howlett and Rayner 2006; Mahoney and Rueschemeyer 2003; Pierson 2011). This research addresses the historical gap in the shale policy literature by examining how enduring differences in natural resource extraction and urban influence placed New York and Pennsylvania on distinct paths of shale policy development.

The next section describes the minimalist path dependency theory that guides this research. This is followed by a brief history of oil and gas production and policy development in New York and Pennsylvania that addresses potential challenges to the argument that shale policy outcomes were path dependent. Then, I consider the historical influence of coal mining (or the lack thereof) in each state, and provide evidence of a path of carbon dependence in Pennsylvania, and an environmental preservation path in New York. I conclude the chapter by summarizing the key aspects of each state’s path that led to distinct trajectories of shale policy development in New York and Pennsylvania.

## THEORETICAL FRAMEWORK AND RESEARCH APPROACH

Path dependence is an important concept within the social sciences, one that is open to various interpretations. Path dependence generally refers to the idea “that what has happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time” (Sewell 2005: 100). A “minimalist” or “soft” concept of path dependence only requires this condition, and implies that historical patterns (e.g., of action, social relations, and meaning) constrain those that occur in the future. Stronger versions of path dependence seek to specify the mechanisms by which constraints are structured, reproduced, or transformed. Particularly within political science and economics, path dependency tends to involve much stronger theoretical claims about how path dependent sequences are set in motion and reproduced. Scholars who argue for a “strong” concept generally conceive path dependence as occurring when an initial event or sequence of events sets in motion a self-reinforcing process that strongly determines later events (Mahoney 2000; Pierson 2011). However, there is some disagreement about the causal importance of initial conditions and contingent events, the degree to which paths are “locked-in”, how sequences are self-reproduced, and the inclusion of reactive sequences (Mahoney and Schenshul 2006).

Minimalist versions of path dependence have been criticized as a vague form of historical explanation (Mahoney 2000; Pierson 2011). Nevertheless, minimal definitions are more flexible. This may have advantages, especially for scholars who are interested in a wider range of temporal concepts and ideas (Mahoney and Schenshul 2006). For example, Sewell proposes an “eventful conception of temporality...that assumes social relations are characterized by path dependency, temporally heterogeneous causalities, and

global contingency” (Sewell 2005: 102). In this case, it seems that a soft version of path dependence is preferred because it is adaptable to a mode of historical explanation or interpretation that “not only specifies multiple causes but sorts out what might be characterized as different registers of causation: preexisting structural conditions (cultural, social, demographic, and economic); conjunctural conditions ...; and contingent strategic or volitional actions” (Sewell 2005: 109).

A minimalist approach to path dependence is particularly appropriate for the analysis of shale policy divergence in New York and Pennsylvania. In these states, shale policies were not determined by “self-reinforcing processes” or “institutional lock-in,” but rather by how distinct extractive and environmental histories combined with trends in political partisanship, interest group mobilization, contingent events and particular strategic actions. Shale policy paths in New York and Pennsylvania were produced by a multiplicity of factors that occurred as particular sequences of events unfolded overtime. An understanding of how “history matters” is achieved through the thick description of these sequences, rather than the identification of a primary factor or set of factors. The remainder of this chapter applies these ideas to understand the historical emergence of a carbon dependence path in Pennsylvania, and a path of environmental preservation in New York. It provides the basis for future chapters, which will discuss how different paths of economic and political development led to distinct trajectories of shale policy development in these states.

## FOSSIL FUEL PRODUCTION AND OIL AND GAS POLICY DEVELOPMENT IN NEW YORK AND PENNSYLVANIA

This section compares historical fossil fuel production and oil and gas policy development in New York and Pennsylvania. Historically, coal mining was the dominant extractive industry within Pennsylvania, and the relative influence of this industry was consequential for the development of distinct policy paths. The fact that New York escaped the ravages of coal mining fundamentally shaped the environmental history of this state. Nevertheless, the current research focuses on oil and gas policy. Historical differences in oil and gas production and policy development are apparent between New York and Pennsylvania, and relevant for understanding distinct trajectories of shale policy development. Yet, there are also similarities between these states that potentially challenge the claim of path dependence. I consider these challenges and show how they are irrelevant for this study.

Traditionally, policy studies consider path dependence to be a feature of institutions, and emphasize how, once established, policy institutions endure overtime. Therefore, a conventional account of path dependence would expect to find that New York and Pennsylvania established distinct oil and gas policy regimes, and that state variations in shale policy resulted from the persistence of these initial differences. Yet, prior to the shale energy boom, state oil and gas policy regimes were in many respects quite similar. Both states supported oil and gas development and imposed relatively similar regulations on the industry. These facts do not contradict the claim of path dependence. I will show that historical differences in oil and gas production and broader

environmental policies placed New York and Pennsylvania on slightly different trajectories of policy development, and provided opportunities for more substantial policy variation as political and economic conditions changed overtime. Specifically, lower levels of oil and gas production, and environmental impact statement (EIS) requirements provided environmental interests in New York with greater political opportunities than those in Pennsylvania. After a brief discussion of historical of fossil fuel production, I describe oil and gas policy development and the stringency of state regulations. I consider the challenge that similarities between state regulatory regimes might pose to the claim that shale policy divergence was path dependent, and argue that such criticisms only hold for strong versions of the concept. I conclude with a discussion of the factors that contributed to shale policy divergence, and a justification for a minimalist approach to path dependency.

### *Historical Fossil Fuel Production*

New York and Pennsylvania were both important to the development of the oil and gas industry in the 19<sup>th</sup> century. However, Pennsylvania was the only one of these two states to become a major energy producer. Historically, oil and gas production was relatively low in New York, and the industry had minimal influence on the state.

Pennsylvania has historically had much higher levels of oil and gas production than New York. Nevertheless, natural gas production was also a minor industry in Pennsylvania prior to the shale gas boom. Coal mining was a much more influential industry within this

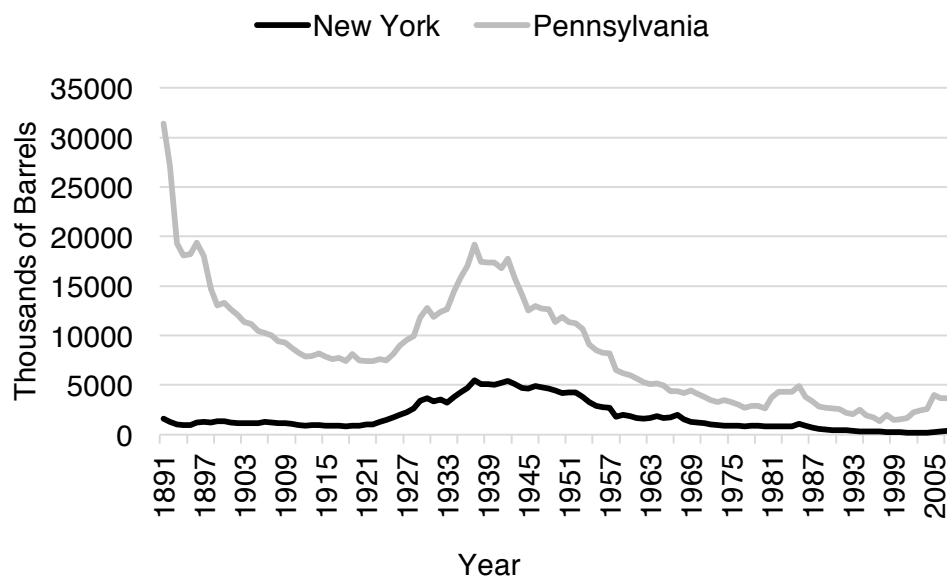
state. Pennsylvania was and remains a major producer of coal, and this extractive industry left a lasting legacy on the state's culture, environment, and economy. Coal mining did not occur in New York, and therefore this state was relatively unaffected by fossil fuel extraction. This section illustrates the differences in fossil fuel production between these states.

The first efforts to commercially produce oil and gas occurred in these states, and over the years, both supplied the nation with significant quantities of oil and gas. In the town of Fredonia, NY, William Hart was the first to sell natural gas as a fuel for lighting and cooking beginning around 1825 (Waples 2005). "Colonel" Drake's discovery of oil in Titusville, Pennsylvania in 1859 famously sparked the first major investments in oil drilling, refining, and marketing (Owen 1975). However, during the early twentieth century, the epicenter of U.S. oil and gas production shifted West to the oil fields of California, Oklahoma, and Texas, and by the 1940s, south to Louisiana (Hamilton 2013). Despite the discovery of new fields throughout the twentieth century, both New York and Pennsylvania remained minor producers of oil and gas compared to these states. It wasn't until the 2000s when energy companies began to explore the Marcellus Shale that this region again faced the possibility of becoming a major center of natural gas production.

Although the history of oil and gas in New York and Pennsylvania bears some similarity, differences between these states are arguably much more significant. Throughout the twentieth century, New York and Pennsylvania experienced more or less contemporaneous periods of boom and bust in oil and gas development. Yet, in every period, Pennsylvania's oil and gas fields proved to be far richer than those of the Empire State. For example, Figure 2.1 displays estimated crude oil production for these states

between 1891 to 2005, and shows that both states experienced a boom in crude oil production during the 1930s and 1940s. During the 1950s, production declined significantly in New York and Pennsylvania, and remained quite low into the twenty-first century. Yet overall, crude oil production was much greater in Pennsylvania than in New York, and dramatically so during the initial discovery period. Estimated crude oil production peaked early in Pennsylvania at 31 million barrels a year in 1891. Even with technological advancements, crude oil production in New York barely peaked at 5 million barrels a year in 1937.

Figure 2.1 Estimated crude oil production for New York and Pennsylvania, 1891 to 2007

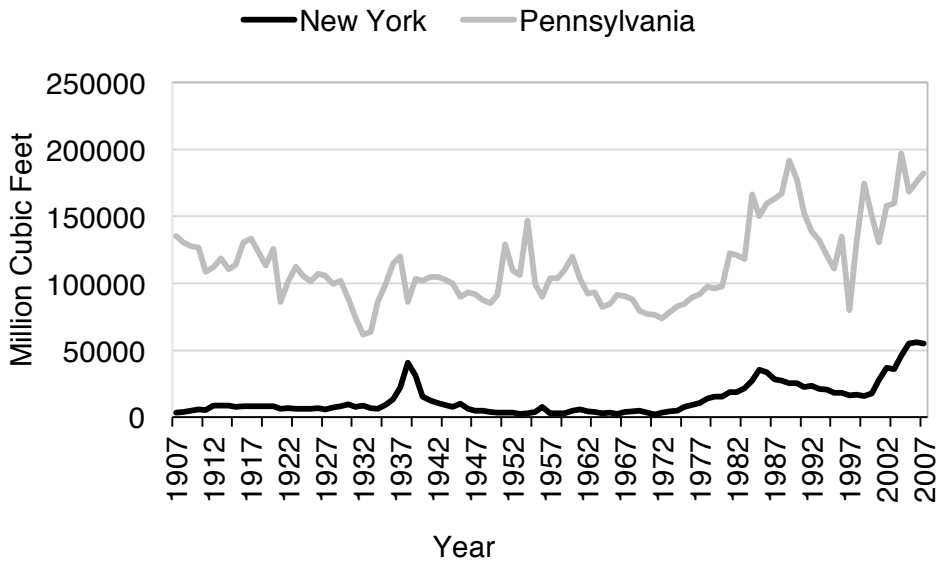


Source: Hamilton 2013

A similar story can be told for natural gas production in these states. Figure 2.2 displays estimated natural gas production for New York and Pennsylvania from 1907 to 2007. In both states, multiple periods of boom and bust occurred over the years. However, Pennsylvania's gas pools were consistently much more productive. For example, peak production during the 1930s in Pennsylvania was more than twice that of New York, and remained strong by comparison throughout the twentieth century. Production in New York peaked at 41 billion cubic feet (bcf) per year in 1938, subsequently declined, and often remained below 5 bcf a year until the 1980s. By contrast, natural gas production in Pennsylvania reached 115 bcf a year in 1936, peaked again at 147 bcf in 1954, and even in periods of low production, rarely fell below 70 bcf a year. The deregulation of natural gas prices and the energy crises of the 1970s led to a major resurgence of drilling in the 1980s. This brought Pennsylvania to a then historic high of 192 bcf a year in 1989. New York reached a near high of 35 bcf a year in 1986. However, drilling and production declined as oil and gas prices fell in the late 1980s. This trend reversed in the 2000s as a spike in natural gas prices encouraged drilling in existing gas plays and test well development in deeper reservoirs such as the Trenton Black River Formation, and the Marcellus Shale. Nevertheless, the difference in production between these states remained stark.



Figure 2.2 Estimated natural gas production for New York and Pennsylvania, 1907-2007

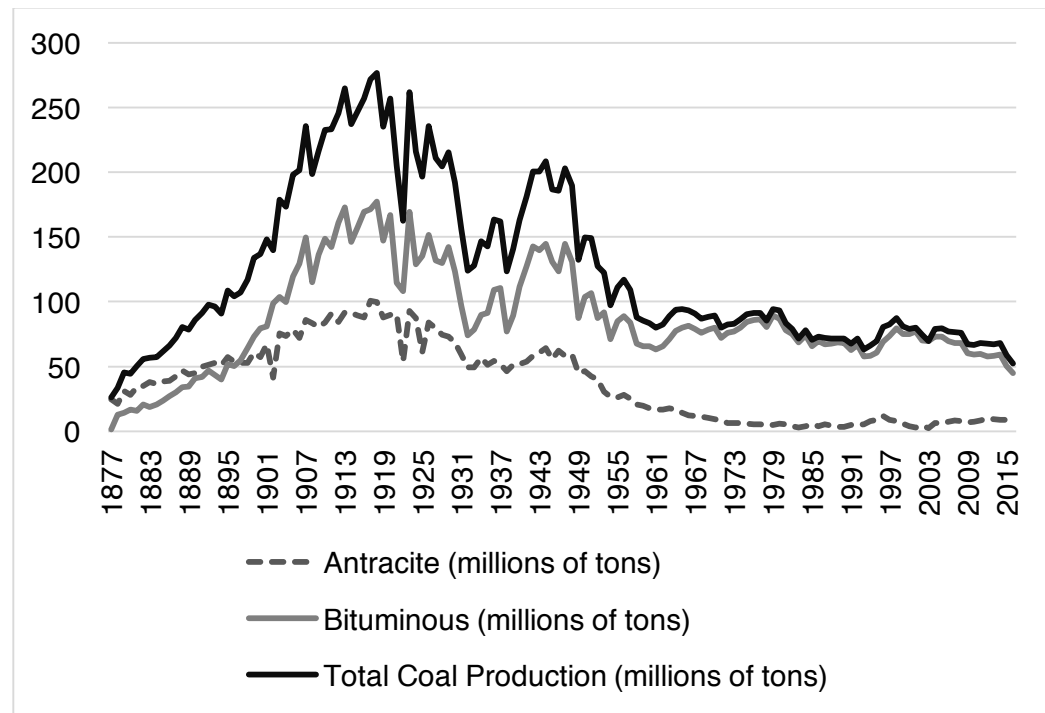


Source: United States Geological Survey and United States Energy Information Administration

Where Pennsylvania truly stands out in terms of fossil fuel extraction is in the production of coal. Two forms of coal are mined in Pennsylvania: anthracite and bituminous. Figure 2.3 displays total coal production in Pennsylvania for anthracite, bituminous, and both forms combined. Anthracite, or hard coal, is a high quality fuel that burns hotter, longer, and cleaner than bituminous coal. These properties make anthracite coal a preferred source of energy for metal production. Pennsylvania contains the only reserves of anthracite coal in the United States, and these reserves led the state to become a global center of steel production during the 19<sup>th</sup> century. From the 1820s to the 1950s, anthracite was heavily mined in Pennsylvania, and contributed significantly to the industrialization of the United States. Anthracite production peaked during World War I,

and by the 1950s, the coal economy had more or less collapsed in Northeastern Pennsylvania. Nevertheless, coal left a lasting legacy on the culture, environment, and economy of the region (MacGaffey 2013). Bituminous coal production also peaked in Pennsylvania during the first half of the twentieth century. Nevertheless, the state continues to produce significant quantities of coal. In 2016, Pennsylvania produced 44.8 million tons of bituminous coal, and 7.6 million tons of anthracite coal, making it the third largest coal producer in the United States (Pennsylvania Department of Environmental Protection 2016a; U.S. Energy Information Administration 2017b).

Figure 2.3 Estimated total coal production in Pennsylvania, 1877-2007



Source: Pennsylvania Department of Environmental Protection 2016a

## *Oil and Gas Policy Development*

Historically, natural resource policy within the United States has prioritized economic development over environmental protection (Andrews 2006). This pattern was evident for oil and gas policy in New York and Pennsylvania prior to the Marcellus Shale gas boom. Early laws were designed to promote efficient resource production, and often modeled after recommendations of the Interstate Oil and Gas Compact Commission (IOGCC), a pro-industry inter-governmental organization.<sup>1</sup> Although policy emphasis shifted to environmental protection following the rise of the environmental movement, New York and Pennsylvania continued to support the oil and gas industry through participation in research consortiums that explored unproven oil and gas reservoirs and by leasing state forest lands for oil and gas development. Yet, there were two important differences between these states' policy institutions. First, New York possessed environmental impact statement (EIS) requirements that did not exist in Pennsylvania. This provided the executive branch significant power to delay and eventually ban unconventional drilling in New York. Second, the fact that very little drilling occurred in New York meant that regulators were even less prepared for the gas boom than those in Pennsylvania. Outdated regulations, limited institutional capacity, and weak representation of industry interests within the NYSDEC provided the environmental movement with greater political opportunities in New York. The following discussion traces oil and gas policy development in these states, and argues that observed similarities mask more fundamental differences that contributed to shale policy divergence.

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<sup>1</sup> The IOGCC was formed in 1935 to ensure that the nation's oil and gas resources were conserved and utilized to their maximum potential.

Like many industries, oil and gas development occurred with little consideration of environmental impacts until well into the 20<sup>th</sup> century. Producing states adopted measures to regulate the casing and plugging of wells as early as the 1870s. While these laws addressed concerns over subsurface freshwater contamination, they were primarily driven by producer interests in preventing the water-flooding of oil pools, which frequently resulted from interstrata contact through drilling holes (Murphy 1948; Bradley 1996). Regardless of intent, early plugging and casing laws were largely ineffective anti-pollution measures since they often lacked enforcement mechanisms, and polluters rarely faced litigation (Bossert and Burcat 2010). The early oil and gas industry was plagued by issues of inefficiency and waste, overproduction, and price instability. Prior to the rise of environmental legislation in the 1970s, state and federal oil and gas policy primarily sought to stabilize the price and supply of oil and gas, and conserve what many believed to be scarce resources (Nash 1968; Isser 1996). In Pennsylvania, legislation also addressed conflicts between coal mine operators and oil and gas well operators, and the safety of underground coal miners.<sup>2</sup> While state laws would eventually emphasize environmental protection, oil and gas conservation provided the initial basis for state regulation and remained an aspect of state oil and gas policy into the contemporary period.

Environmental regulations for oil and gas E&P were layered on top of earlier conservation statutes. The provisions and intent of state conservation statutes were very similar. New York's provisions were modeled after recommendations developed by the

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<sup>2</sup> Pennsylvania's Gas Operations Well-Drilling Petroleum and Coal Mining Act of 1955 required a permit before drilling wells within the boundaries of an operating or projected coalmine, records for any well drilled within a workable coal seam, and detailed casing and plugging procedures for such wells.

Interstate Oil Compact Commission.<sup>3</sup> In Pennsylvania, they likely were as well. Pennsylvania's Oil and Gas Conservation Law of 1961 and New York's Oil, Gas, and Solution Mining Law of 1963 sought to protect correlative rights, prevent waste, and maximize the ultimate recovery of each state's oil and gas resources. To accomplish these goals, the statutes utilized well permitting requirements and established provisions for well spacing and compulsory integration (or pooling) of interests in spacing units. In Pennsylvania, oil and gas permitting was the responsibility of the Division of Oil and Gas within the Department of Mines and Minerals. New York established a Division of Oil and Gas within its Conservation Department. In both states, initial permit requirements effectively applied only to wells drilled in newly discovered gas fields, and were difficult to enforce. Contemporary regulatory programs for oil and gas were created in these states by expanding, and strengthening the enforcement of permitting requirements to mitigate the environmental impacts of drilling.

The rise of environmentalism during the 1960s and 1970s led New York and Pennsylvania to pass numerous laws to address air and water pollution, and to control the disposal of solid wastes (Edmondson 2001; Kury 2011). The New York Department of Environmental Conservation (NYSDEC) and the Pennsylvania Department of Environmental Resources (PADER) were established in 1970 to implement and enforce these environmental statutes. Both states' Divisions of Oil and Gas were reorganized within the new environmental agencies. While this integrated oil and gas permitting with a larger project of environmental protection, it was not until the 1980s that these states

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<sup>3</sup> Testimony by John Harmon, Assistant Director of the Division of Mineral Resources, New York State Department of Environmental Conservation, at a hearing held by the New York State Assembly Standing Committee on Environmental Conservation on November 16, 2004 in Elmira, NY.

formally established environmental regulations for oil and gas E&P. Although states adopted similar regulatory measures and settings, policy development in New York and Pennsylvania exhibited substantial procedural differences. Whereas policy development in Pennsylvania occurred through a typical process involving the passage of legislation and promulgation of regulations, New York's regulatory regime was established through an environmental impact statement (EIS) of the state's oil and gas regulatory program.

Pollution control was formally incorporated into Pennsylvania's oil and gas law after six years of debate with the passage of the Oil and Gas Act of 1984 (Interstate Oil and Gas Compact Commission 1992). This act created a comprehensive regulatory program that integrated environmental protection with other aspects of oil and gas regulation (i.e., well permitting, drilling, bonding, operation, inactive status, reporting, and plugging). From an environmental perspective, significant provisions included detailed requirements for well casing, well plugging, and well site construction and reclamation to protect water supplies, and to prevent soil erosion, and reduce impacts on wildlife habitats. Importantly, the law expanded and strengthened well permitting. Permits granted under the Gas Operations Well-Drilling Petroleum and Coal Mining Act of 1955, and Oil and Gas Conservation Law of 1961 were little more than a registration of wells since neither statute granted state agents the authority to deny permits (Interstate Oil and Gas Compact Commission 1992). The Oil and Gas Act of 1984 authorized the denial, suspension, and revocation of permits, and extended permit requirements to any well drilled for the purposes of oil and gas production, storage, or brine disposal. Furthermore, it required the Department of Environmental Resources (now, the

Department of Environmental Protection) to develop permit requirements in compliance with other environmental statutes, rules, and regulations.<sup>4</sup>

With the Oil and Gas Act of 1984, Pennsylvania established a modern oil and gas regulatory regime intended to optimize natural resource development, mitigate adverse environmental impacts, and protect the health and safety of the public.<sup>5</sup> The permit process became the cornerstone of oil and gas regulation. The Department of Environmental Resources exercised its authority by requiring well operators to comply with permit requirements designed to meet the demands of the Oil and Gas Act, the Oil and Gas Conservation Law, and state environmental statutes. The department promulgated regulations to enforce and implement these statutes in 1987. Title 25, Chapter 78 of the Pennsylvania Code established the rules, requirements and protocols for the department's oil and gas regulatory program. It required well operators to submit an application prior to drilling any oil or gas well that documented in detail how operators planned to comply with agency requirements regarding well siting and construction, the storage and disposal of waste, and well operation and abandonment. Within the department, the Bureau of Oil and Gas Management was granted primary authority for permitting and enforcement. Approved projects were evaluated for compliance based on well operator reports and periodic inspections by the department. While oil and gas conservation remained an aspect of state regulation, emphasis shifted

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<sup>4</sup> In 1995, the Department of Environmental Resources was abolished and its functions separated into two agencies, the Department of Environmental Protection, charged with enforcement of state environmental laws, and the Department of Conservation and Natural Resources, responsible for the management of state parks and state forest lands.

<sup>5</sup> Minor amendments were made to the act in 1986, 1992, and 1995.

towards ensuring that oil and gas E&P occurred in a safe and environmentally responsible manner.

While New York's Oil, Gas, and Solution Mining Law of 1963 did not expressly include environmental protection as a policy goal, its provisions combined with other state environmental statutes granted the NYSDEC broad powers to regulate oil and gas E&P activities. By the 1980s, the agency had begun to use special permit conditions to address environmental and safety hazards in critical areas, such as fresh water aquifers and high pressure reservoirs like the Bass Island Trend (New York Department of Environmental Conservation 1988). The regulation of oil and gas E&P was managed primarily by the Bureau of Oil and Gas Regulation within the Division of Mineral Resources, which had responsibility for permitting and inspecting well operations, and addressing violations. However, department efforts were constrained by limited financial resources and exemptions for wells drilled in old oil and gas fields (New York Department of Environmental Conservation 1988). Regulators also lacked a clear framework and justification for the use of special permit conditions since the agency had largely failed to revise oil and gas regulations originally promulgated in 1972 (New York Department of Environmental Conservation 1988; Interstate Oil and Gas Conservation Commission 1994).

In 1981, important amendments to the Oil, Gas, and Solution Mining Law removed the distinction between old and new fields and applied the same restrictions to all oil and gas wells in New York State (New York Department of Environmental Conservation 1988).<sup>6</sup> The 1981 amendments also dramatically increased the permit fee,

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<sup>6</sup> NY Session Laws 1981, Chapter 846



and consolidated and strengthened enforcement provisions. However, the law fundamentally remained an oil and gas conservation statute. Its stated purpose was not expanded beyond the original intent to prevent waste, increase ultimate recovery, and protect correlative rights. Apart from general provisions establishing the NYSDEC's authority to prevent and remedy the pollution of freshwater supplies from oil and gas activities, the law remained silent on the subject of environmental protection.

New York did not formally establish a comprehensive environmental regulatory program for oil and gas until 1992. Significantly, this occurred not through legislation and administrative rulemaking, but via an environmental impact statement (EIS) authorized under the State Environmental Quality Review Act (SEQRA) of 1975. The SEQRA is modeled after the National Environmental Policy Act (NEPA). It requires an EIS for any state or local agency action, which may have a significant impact on the environment. The SEQRA provides agencies with substantial authority to review, and disapprove or impose substantive conditions upon an action deemed to have a significant adverse impact on the environment. Its "action forcing" or "substantive" requirement provides a mechanism for policy development independent of legislation and administrative rulemaking since mitigative measures imposed by a final EIS have the same force of law as statutory or administrative code (Ginsberg and Weinberg 2001). The NYSDEC utilized provisions allowing for the completion of a generic EIS for an entire regulatory program to establish an environmental regulatory framework for oil and gas E&P.

The *Final Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program* (henceforth, the "GEIS") published in 1992 was the

culmination of a twelve-year effort to evaluate the impact of oil and gas drilling and establish clear guidelines for operators and regulators (New York State Department of Environmental Conservation 2009). It provided a detailed description of industry practices and adverse environmental impacts, and recommended mitigative measures to be required as part of the permitting process. The SEQRA requires agencies to strike a balance between social and economic goals, and environmental concerns in making a final determination for an activity subject to an EIS. In adopting the GEIS, the NYSDEC found that the permitting of oil and gas wells was consistent with these considerations so long as the proposed mitigative measures were adopted. These included specifications for well siting and construction, the storage and disposal of waste, and well operation and abandonment. Well operator reports and periodic inspections by the department were also required for approved projects. Interestingly, although the GEIS recognized the need for additional regulations to comply with the program's findings, the NYSDEC did not formally promulgate new regulations (New York State Department of Environmental Conservation 1992). Rather, the agency utilized the SEQRA's substantive mandate to impose additional conditions for the approval oil and gas well permits.

Major changes to New York and Pennsylvania's oil and gas policy are summarized in Table 2.1. Policy variation before and after the passage of oil and gas conservation statutes in the 1960s are attributable to differences in natural resource extraction. Pennsylvania experienced extensive coal mining, and oil and gas E&P. Oil and gas drilling in active coal mines posed significant risks to coalminers and coal mine operators, which became apparent during the 1950s drilling boom (see Figure 2.2). This spurred the first serious effort to regulate the oil and gas industry in Pennsylvania in

1955. In the 1960s, similar oil and gas conservation measures were passed in both states at the instigation of the Interstate Oil and Gas Compact Commission. During the 1970s, environmental regulatory regimes also began to take shape in these states as regulatory authority over the oil and gas industry was transferred to newly established state environmental agencies. By the late 1970s, serious debates over the environmental regulation of oil and gas E&P had emerged in New York and Pennsylvania. Yet, at this point, state policy paths diverged. Whereas Pennsylvania passed comprehensive environmental legislation for oil and gas in 1984, New York did not establish a formal environmental regulatory framework until 1992, and it did so by administrative (i.e., the GEIS) rather than legislative means. In New York, the regulatory delay and failure to enact oil and gas legislation pursuant to the GEIS can be explained by the fact that minimal drilling occurred in this state. As a result, policymakers had little incentive to commit scarce resources to this policy issue.

Table 2.1 Major Changes in the Oil and Gas Policies of Pennsylvania and New York, 1955-2007

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Pennsylvania

1955	Gas Operations Well-Drilling Petroleum and Coal Mining Act requires permitting and casing of wells drilled within active or projected coal mine.
1961	Oil and Gas Conservation Law imposes permit, casing, spacing, and compulsory integration requirements for wells drilled in new fields.
1970	Bureau of Oil and Gas Management reorganized within the newly established Pennsylvania Department of Environmental Resources (PADER).
1971	Environmental Rights Amendment to the Pennsylvania Constitution guarantees all citizens the right to clean air and pure water.
1984	Oil and Gas Act extends permitting requirements to all new wells, adds environmental protection measures, and authorizes denial of permits.
1987	PADER promulgates regulations under Oil and Gas Act of 1984.

New York

1963	Oil, Gas, and Solution Mining Law imposes permit, casing, spacing, and compulsory integration requirements for wells drilled in new fields.
1970	Bureau of Oil and Gas Regulation reorganized within the newly established New York Department of Environmental Conservation.
1975	State Environmental Quality Review Act requires environmental impact statements for any state or local agency action, which may have a significant impact on the environment.
1981	Amendments to Oil, Gas, and Solution Mining Law removed the distinction between old and new fields.
1992	Final Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program requires environmental protection measures.

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## *The Stringency of Regulations*

New York's use of an environmental impact statement to regulate oil and gas E&P is a major point of departure from Pennsylvania. The question remains as to whether this resulted in more stringent regulations. The SEQRA granted regulators in New York a potentially stronger mechanism for addressing environmental impacts, since it explicitly required the NYSDEC to balance social and economic goals with environmental concerns. Yet, New York adopted regulatory measures that were relatively similar to those found in Pennsylvania. On the surface, this might seem to challenge the claim that these states were on distinct paths of shale policy development. I argue that each state's trajectory of oil and gas development was defined less by the substance of regulations than by the particular rulemaking procedures that brought them about. New York did not adopt significantly stronger oil and gas regulations in 1992 than Pennsylvania did in 1984 because there was little pressure from the public to do so. However, New York's SEQRA provided for a rulemaking procedure that was significantly more susceptible to public influence. After comparing the stringency of state oil and gas regulations, I consider how this procedural difference contributed to shale policy divergence in New York and Pennsylvania.

Appendix A provides a detailed assessment of the stringency of oil and gas regulations in these states prior to the Marcellus Shale gas boom. A convenient measure for comparison is the Oil and Gas Policy (OGP) Index, which measures the total number of policies adopted by states with higher scores indicating more stringent regulatory regimes. New York received a score of ten out of twenty, while Pennsylvania had a score of eight. This suggests that New York's oil and gas regulatory program was only slightly

stronger than Pennsylvania's. New York prohibited the use of open pits and evaporation ponds to store drilling waste. It also required operators to keep transportation records for wastes, while in Pennsylvania only those transporting waste water were required to do so. Alternatively, Pennsylvania had a liability presumption policy that made well operators more accountable for water pollution, which New York did not have. New York imposed stronger restrictions for drilling within primary and principal aquifers, and for well idling and abandonment. However, settings for well setbacks and well casing were comparable across states. Overall, New York's regulations were only slightly stronger than those in Pennsylvania.

Although New York and Pennsylvania utilized different rulemaking procedures to establish regulatory programs for oil and gas E&P, in the end, these states adopted relatively similar regulatory regimes. In both states, well permitting and inspections provided the primary mechanism for mitigating the environmental impacts of drilling. Special departments for oil and gas regulation were established within each state's environmental regulatory agency. New York and Pennsylvania also imposed similar requirements and restrictions on well operators. Researchers that employ a strong conceptualization of path dependency might argue that these facts challenge the idea that shale policy divergence in New York and Pennsylvania was path dependent. Strong path dependency theory would explain policy divergence by arguing that different historical contexts led to fundamental differences in state regulatory regimes, which persisted overtime as a result of the increasing returns associated with established policy institutions. However, a minimalist approach allows for a more flexible formulation in which differences between New York and Pennsylvania policy paths only become

significant much later as new sequences of actions and events unfold following the shale energy boom.

The fact that SEQRA requirements existed in New York, but not in Pennsylvania was an important factor that contributed to distinct paths of shale policy development in these states. However, I argue that shale policy divergence is best explained by a more general form of path dependence that led to distinct political economies and environmental approaches in New York and Pennsylvania. The next section considers the economic development and environmental histories of New York and Pennsylvania, and illustrates how differences in natural resource extraction and urban influence placed these states on unique policy paths.

## THE DIVERGENT CONSEQUENCES OF CARBON DEPENDENCE AND ENVIRONMENTAL PRESERVATION

The historical role of extractive industries was very different within New York and Pennsylvania. Whereas energy production significantly shaped Pennsylvania's environment and political economy, in New York, resource extraction was a minor industry that had very little influence. I argue that historical differences in resource extraction led to distinct paths of political and economic development within these states, which in turn, contributed to shale policy divergence. While New York and Pennsylvania had distinct extractive histories, in other respects, these states are quite similar. Both are relatively large in terms of land area, population, and gross domestic product (GDP), and

characterized by a substantial rural/urban divide with regards to culture, politics, and economic prosperity. However, Pennsylvania tends to be more politically conservative than New York. Although New York and Pennsylvania possess similar socioeconomic characteristics, different paths of political and economic development are discernable. I argue that these paths are important for understanding contrasting approaches to shale gas development in New York and Pennsylvania.

Contemporary measures of social and economic development reveal more similarities than differences between New York and Pennsylvania. Observed differences are largely attributable to the relative influence of the largest metropolitan areas within each state. The first part of this section compares key social and economic characteristics for New York and Pennsylvania, and discusses how distinct urban influences set these states apart. This is followed by an examination of state economies overtime that points to some relevant differences in industrial composition. In particular, time-series data on employment by industry reveals the historical importance of mining and energy intensive manufacturing in Pennsylvania. This placed Pennsylvania on a path of carbon dependence that supported favorable policy positions towards unconventional oil and gas development. Natural resource extraction and energy intensive industries were historically much less important in New York. As a result, politicians and the public were less likely to associate the shale gas boom with a bygone period of economic prosperity. Rather, unique features of New York's environmental history and political economy supported a path of environmental preservation that encouraged resistance to the shale gas boom. This section describes the mix of factors and events that placed New York and Pennsylvania on distinct paths of shale policy development.



### *Key Social and Economic Characteristics and Urban Influence*

Table 2.2 presents key social and economic characteristics in 2000 for New York and Pennsylvania compared to those for the United States. In terms of land area, these are relatively large states. New York encompasses 47,126 square miles, while Pennsylvania has a land area of 44,742 square miles. Both states also have large populations. However, New York, with close to 19 million people in 2000, was more populous than Pennsylvania, which had a population of 12.2 million. New York City, with a population of about 8 million in 2000, largely accounted for this difference, as well as, differences in rural population between these states. 12.5% of New York State's population was considered rural compared to 22.9% in Pennsylvania, which was closer to the national average of 21%.

New York and Pennsylvania both have large economies. However, a consideration of per capita GDP suggests that average prosperity is significantly greater in New York than in Pennsylvania. This difference can also be attributed to New York City, which is the largest metropolitan area in the United States and a major center of global finance. The gross domestic product (GDP) of New York State was about 1 trillion dollars, and ranked second in the nation in 2000. At \$5.1 billion, Pennsylvania's GDP was only about half of New York's. Pennsylvania's GDP ranked sixth among all U.S. states. Per capita GDP also reveals considerable differences in the overall strength of New York and Pennsylvania's economies. Per capita GDP in New York was almost \$54,000 in 2000, and ranked fifth in the nation. By contrast, per capita GDP in Pennsylvania was about \$42,000, which was slightly less than the national average of about \$45,000. Pennsylvania's per capita GDP in 2000 ranked 25<sup>th</sup> among U.S. states.

Table 2.2 Key Social and Economic Characteristics in 2000

	United States	New York	Pennsylvania
<u>Population</u>	281,421,096	18,976,457	12,281,054
Rural population (%)	21.0	12.5	22.9
Poverty rate	12.1	14.6	11.0
Unemployment rate	4.0	4.5	4.1
Percent aged 25 or older with at least a high school degree	80.4	79.1	81.9
Percent aged 25 or older with at least a bachelor's degree	24.4	27.4	22.4
<u>Gross Domestic Product</u>			
Real GDP (millions of chained 2009 dollars)	12,616,533	1,022,817	514,175
Real per capita GDP	44,714	53,827	41,857
Real GDP rank in the U.S.		2	6
Real per capita GDP rank in the U.S.		5	25

Source: U.S. Census Bureau, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics

While per capita GDP suggests that Pennsylvania's economy was weaker than New York's, New York actually had slightly higher unemployment and poverty rates than Pennsylvania. 14.6% of New York's population was below the federal poverty level in 2000, slightly more than the national average of 12.1%. On this measure, Pennsylvania's economy performed slightly better with a poverty rate of 11%. At 4.5%, New York's unemployment rate was only slightly higher than Pennsylvania's, which was about 4% and close to the national average. Education is another factor commonly linked to economic performance, and on this measure, the two states were also relatively similar. Both New York and Pennsylvania were close to the national average in terms of the percent of the population aged 25 or older that had at least a high school degree in 2000

(about 80% respectively). In New York, the percent of the population aged 25 or older with at least a bachelor's degree (27.4%) was slightly higher than the national average (24.4%), and 5% higher than the figure for Pennsylvania (22.4%).

Macro-level economic and social indicators indicate that, while New York has a stronger economy than Pennsylvania, the average socio-economic characteristics of these states (e.g., unemployment, poverty, and education) are relatively similar. State differences in economic performance and urbanization are largely attributable to differences between New York and Pennsylvania's largest urban centers. New York City is the largest metropolitan area in the United States, and in many ways, defines the political economy of New York State. Philadelphia is much smaller by comparison, and has substantially less political and economic influence in Pennsylvania.

Table 2.3 displays the real GDP and per capita GDP for the metropolitan statistical areas (MSA), which are anchored by New York City and Philadelphia. Data are provided for 2001, the earliest year for which estimates by MSA were available online through the U.S. Bureau of Economic Analysis. At about \$1.2 trillion, real GDP for the New York City metro area was almost 4 times the real GDP of the Philadelphia metro area (\$300 million). The per capita GDP for the New York City metro area (\$61,229) was also significantly higher than that of the Philadelphia metro area (\$52,569). A comparison of the ratio of GDP by MSA to GDP by state is even more striking. In 2001, the New York City metro area had a GDP that was 1.11 times that of New York State. By contrast, the Philadelphia metro area had a GDP that was equal to only 58% of Pennsylvania's GDP.

Table 2.3 Gross Domestic Product by Metropolitan Statistical Area (MSA) in 2001

	New York City <sup>1</sup>	Philadelphia <sup>2</sup>
Real GDP (millions chained 2009 dollars)	1,170,042	300,375
Real GDP per capita	61,229	52,569
Real GDP for New York State	1,056,708	
Real GDP for Pennsylvania		522,191
Ratio MSA GDP to State GDP	1.11	0.58

Source: U.S. Bureau of Economic Analysis

<sup>1</sup>New York-Newark-Jersey City, NY-NY-PA

<sup>2</sup>Philadelphia-Camden-Wilmington, PA-NJ-DE-MD

In many respects, New York and Pennsylvania are similar. They are populous and expansive states with large economies and similar socioeconomic characteristics.

However, New York has a much larger and more prosperous economy than Pennsylvania. This is primarily due to the tremendous economic influence of New York City. By contrast, the Philadelphia metro area comprises a much weaker economy, which has less economic influence within Pennsylvania. As a consequence of its size and economic importance, New York City has considerable influence on state politics. Later chapters will show that urban elites based in New York City had substantial influence on shale policy development in New York State. The latter part of this section will place New York City's political influence within historical context. Before doing so, a comparison of employment by industry reveals differences in the structure of state economies, that in addition to urban influence, placed New York and Pennsylvania on distinct paths of development.

### *Employment by Industry in New York and Pennsylvania*

A consideration of employment by industry in New York and Pennsylvania shows some similarities between these states, but also important differences that are relevant for understanding shale policy divergence. Table 2.4 presents total employment by industry for New York, Pennsylvania, and the United States in 1940 and 2000. In both years, New York and Pennsylvania had relatively similar distributions of total employment across industries, and for a number of industries, figures for these states were comparable to the nation overall. Between 1940 and 2000, the United States transitioned from a manufacturing-based to a service-based economy, and New York and Pennsylvania followed this trend. However, in 1940 and 2000, there were differences in employment by industry that set New York and Pennsylvania apart from each other and the nation as a whole. In 1940 and 2000, New York had a competitive advantage in finance, insurance, and real estate, while Pennsylvania had a competitive advantage in manufacturing. In 1940, Pennsylvania also had a competitive advantage in mining. By 2000, Pennsylvania's mining industry was no longer stronger than the nation's, but it remained stronger than New York's. I examine these trends in greater detail and argue that they reveal some of the conditions that contributed to path dependence.

In 1940, manufacturing was the largest industry in terms of total employment in the United States and provided almost 34% of the nation's jobs. During this period, manufacturing was also the largest industry in New York and Pennsylvania. In New York, the percentage of employment in manufacturing in 1940 was almost equal to the national figure of 34%. The manufacturing sector was somewhat stronger in Pennsylvania, providing 39% of the state's jobs in 1940. Interestingly, Pennsylvania

retained this competitive advantage following the transition to a service-based economy. By 2000, the service industry had replaced manufacturing as the nation's top employer. In 2000, only 14% of total employment within the United States was in manufacturing, while almost 31% of total employment was in services. By 2000, services had also replaced manufacturing as the largest industry in New York and Pennsylvania. However, manufacturing continued to employ a higher percentage of workers in Pennsylvania than in New York, and the nation overall. In 2000, manufacturing comprised about 16% of all jobs in Pennsylvania, while almost 33% of the state's jobs were in services. For the same year in New York, 10% of all jobs were in manufacturing, and 35% were in services.

Despite enduring differences in the relative strength of manufacturing in New York and Pennsylvania, the composition of the manufacturing industry actually became more similar in these states overtime. Table 2.5 presents employment by manufacturing sector for the United States, New York, and Pennsylvania in 1947, the first year these data are available, and in 2000. Between 1947 and 2000, manufacturing employment declined in all sectors within New York, Pennsylvania, and the United States. To some extent, this supported a convergence of New York and Pennsylvania's manufacturing industry as all kinds of production moved to cheaper labor markets overseas.

Nevertheless, meaningful differences in manufacturing remained, and point to distinct paths of economic development in New York and Pennsylvania that persisted overtime.

In 1947, Pennsylvania's largest manufacturing sector produced primary and fabricated metal products and industrial machinery. This sector alone comprised 15% of total employment in Pennsylvania. By contrast, the production of metal products and industrial machinery contributed 8.35% to total employment in the U.S., and 4.39% to

total employment in New York in 1947. In Pennsylvania, the strength of this sector largely stemmed from the role this state played in the development of the U.S. steel industry. The United States became a global leader in steel production in the late nineteenth century through the innovations of Andrew Carnegie, who based his operations in Pittsburg, Pennsylvania. During the early twentieth century, the two largest steel companies in the United States, U.S. Steel (formerly Carnegie Steel) and Bethlehem Steel, were located in the Keystone State. Steel production is an energy intensive process, and Pennsylvania's abundant coal resources helped to consolidate the state's position as a top primary metals producer. This, in turn, supported the growth of a manufacturing cluster oriented around fabricated metals and industrial machinery. Even after production moved to low cost labor markets in the late twentieth century, Pennsylvania retained a competitive advantage in this sector. In 2000, the production of primary and fabricated metals, and industrial machinery was the largest manufacturing sector in Pennsylvania, and provided 4.5% of the state's jobs. In comparison, this sector contributed 3.3% to U.S. total employment, and about 2% to total employment in New York in 2000.

Throughout much of the twentieth century, Pennsylvania coal supported the production of Pennsylvania steel. The historical importance of energy for this state's economy cannot be overstated. Returning to Table 2.4, we see that mining provided 7.7% of Pennsylvania's jobs in 1940. This was more than twice the percentage of employment in mining within the United States (2.9%), and 40.5 times the percentage of employment in mining in New York (.19%) in 1940. Mechanization and competition from cheap petroleum and other coal mining states led to a precipitous decline in mining employment in Pennsylvania between 1940 and 1960 (see Figure 2.4). By the early 1960s, mining

employment in Pennsylvania was no longer significantly different than that for the nation overall. In 2000, less than 1% of total employment came from mining in either Pennsylvania or the United States. (Mining industries remained relatively absent from New York State in 2000.) Nevertheless, Pennsylvania ranked 4<sup>th</sup> in coal production out of 50 U.S. states in 2000 (U.S. Energy Information Administration 2018). By the twenty-first century, the economic significance of coal mining may have waned in Pennsylvania, but the state's status as a major energy producer helped keep the cultural legacy of coal alive.

Coal mining left a cultural and environmental imprint on Pennsylvania that supported favorable views of unconventional oil and gas development among politicians and the public. Historically, Pennsylvania's abundant energy resources supported the development of an energy intensive manufacturing sector, which remained important into the contemporary period. As a result, the shale gas boom not only signified a potential expansion of jobs within the oil and gas industry, but also represented renewed energy abundance capable of supporting current and future possible industries. In this manner, Pennsylvania's path of carbon dependence helped to place the state on a trajectory of shale policy development that prioritized resource extraction over environmental protection. Extractive industries and energy intensive manufacturing did not have the same economic or cultural significance in New York State. Having escaped the environmental ravages of coal mining, New York was able to follow an environmental preservation path that led to the formation of a liberal urban elite with an interest in maintaining the state's environmental quality. The political influence of environmental interests in New York encouraged political decision-makers to take a precautionary



approach to the regulation of unconventional drilling. The last two parts of this section further illustrate the enduring influence of natural resource extraction on the political economy of the Keystone state, and describe the historical events that shaped New York's path of environmental preservation.

Table 2.4 Total Employment by Industry in 1940 and 2000

	United States			New York			Pennsylvania		
	1940 %	2000 %	1940-2000 Change	1940 %	2000 %	1940-2000 Change	1940 %	2000 %	1940-2000 Change
Mining	2.86	0.41	-2.45	0.19	0.05	-0.14	7.68	0.34	-7.34
Construction	4.05	5.05	1.00	3.30	3.80	0.50	3.04	4.34	1.30
Manufacturing	33.95	14.02	-19.92	33.79	10.16	-23.63	39.20	16.30	-22.90
Transportation and public utilities	9.39	5.34	-4.05	9.79	5.01	-4.78	9.35	5.31	-4.03
Trade	20.86	22.99	2.13	20.60	20.17	-0.43	17.10	22.38	5.28
Finance, insurance, and real estate	4.59	5.75	1.16	8.48	8.65	0.17	3.37	5.73	2.36
Services	11.33	30.71	19.39	12.45	35.16	22.71	10.17	32.87	22.70
Total government	12.98	15.72	2.73	11.40	17.00	5.59	10.10	12.74	2.64
Total non-farm <sup>2</sup>	32,361.00	131,720.00	307.03	4,324.7	8,635.3	99.67	2,893.5	5,691.2	96.69

Source: Bureau of Labor Statistics

<sup>2</sup>Thousands of workers

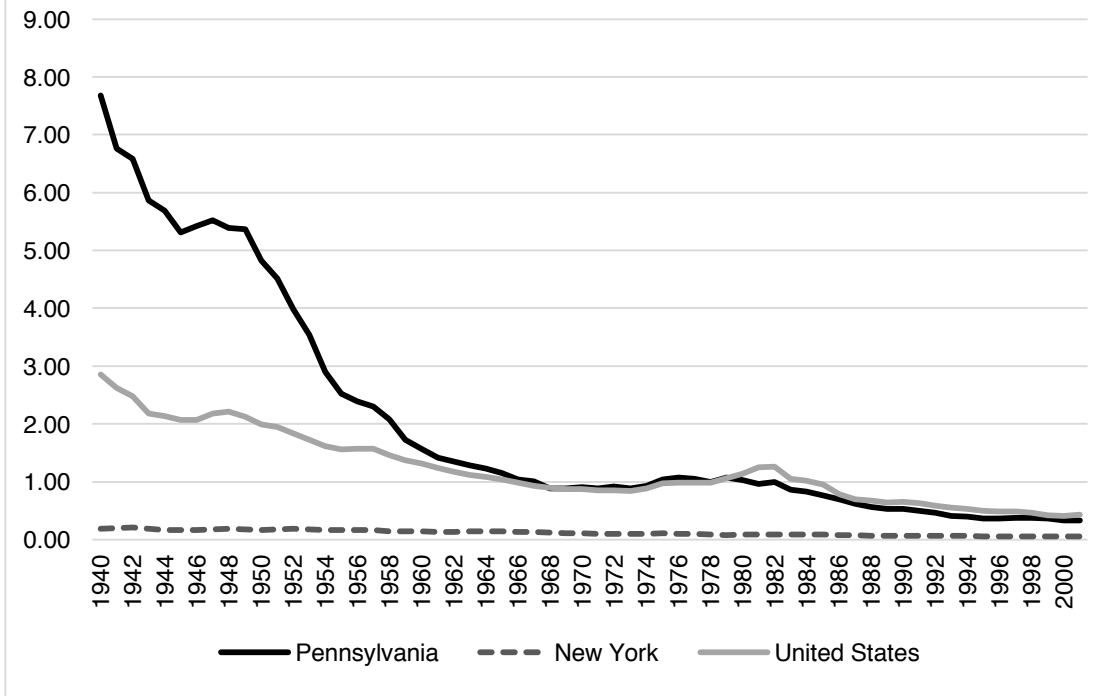
Table 2.5 Employment by Manufacturing Sector

	United States			New York			Pennsylvania		
	1947 %	2000 %	1947 to 2000 Change	1947 %	2000 %	1947 to 2000 Change	1947 %	2000 %	1947 to 2000 Change
Lumber, Wood Products, and Furniture	2.74	1.05	-1.69	1.13	0.40	-0.73	1.15	1.01	-0.14
Stone, Clay, And Glass Products	1.16	0.44	-0.72	0.85	0.31	-0.54	2.19	0.69	-1.51
Primary and Fabricated Metal and Industrial Machinery	8.35	3.31	-5.04	4.39	1.99	-2.40	15.06	4.53	-10.53
Electronic & Other Electric Equipment	1.95	1.31	-0.64	2.33	1.01	-1.31	3.03	1.44	-1.60
Transportation Equipment	2.88	1.41	-1.47	1.65	0.36	-1.29	1.55	0.87	-0.68
Instruments And Related Products	1.03	0.64	-0.39	1.76	0.93	-0.83	0.67	0.62	-0.04
Food and Tobacco	4.37	1.31	-3.06	3.38	0.67	-2.71	3.86	1.50	-2.37
Textile, Apparel, and Leather	6.53	0.94	-5.59	10.77	1.02	-9.75	8.85	0.98	-7.87
Paper and Printing	2.70	1.67	-1.02	4.10	1.94	-2.16	2.55	2.03	-0.51
Chemicals, Petroleum, Rubber, and Plastics Products	2.79	1.65	-1.14	2.19	1.06	-1.13	2.59	2.29	-0.30
Total non-farm <sup>2</sup>	43857.00	131720.00		5518.20	8635.30		3673.50	5691.20	

Source: Bureau of Labor Statistics

<sup>2</sup>Thousands of workers

Figure 2.4 Percent of Total Employment in Mining, 1940-2000



## *Pennsylvania and the Legacy of King Coal*

In this section, I identify a few key ways in which a history of resource extraction contributed to a policy context that favored the oil and gas industry in Pennsylvania. Like other extractive states, Pennsylvania has historically prioritized resource development over environmental protection. I consider how state forest management policies and renewable energy policies provide evidence that this policy tradition persisted prior to the shale gas boom. This discussion serves to establish the existence of an enduring path of carbon dependence in Pennsylvania. Later chapters will discuss how this placed the state on a trajectory of shale policy development that prioritized resource extraction.

### *State forest management*

With 2.2 million acres of public forest land, Pennsylvania has, along with Michigan and Washington, one of the largest state forest systems in the country. On account of this fact, Pennsylvania has often been celebrated as an exemplar of state forest management. While Pennsylvania has achieved a great deal in forestry planning and conservation, Samuel P. Hays (2007) argues that these accomplishments were rooted in a commodity wood production culture that prevented the incorporation into state policy advancements in environmental science and ecological forestry. Watershed protection was originally the primary goal behind the establishment of Pennsylvania's state forest system. Hays documents how institutional memory of this original purpose was slowly lost as successive revisions of administrative policy shifted emphasis towards ensuring a "continuous supply of wood products."

Pennsylvania's state forestry system was established in the 1920s following widespread deforestation by the lumbering boom of 1850 to 1900. Deforestation created a number of problems, not the least of which was soil erosion and the severe impairment of watersheds. Legislators at the time looked to the establishment of state forest lands as a means to protect watersheds, and thus, sustain public water supplies. Interestingly, Pennsylvania's original forest policy was partially modeled after New York's effort to preserve the Adirondack watershed. Whereas New York went so far as to amend its state constitution in 1894 to proclaim its Forest Preserve as "forever wild" and prohibited from future lease, sale, or logging (Edmondson 2001), Pennsylvania would open its state forests to commercial logging, mining, and oil and gas development.

The early importance of watershed protection for Pennsylvania's state forest management system was reflected in the formation of the Department of Forest and Waters in 1923, which integrated the functions of the Department of Forestry, the Water Supply Commission and the Bureau of Topographic and Geologic Survey. However, after World War II, wood production became the central focus of Pennsylvania state forest management. Forest assessment emphasized the classification of lands in terms of the requirements of wood production. The shift away from watershed protection meant that a potential pathway for the adoption of modern ecological forestry was lost in Pennsylvania. The organizational fragmentation of Pennsylvania's environmental agencies placed further barriers to more environmentally-friendly state forest management. The Department of Forest and Waters was absorbed into the Department of Environmental Resources (DER) in 1971, resulting in the creation of a separate Bureau of Forestry and Bureau of Water Quality. By the 1990s, watershed protection was not a

major priority of the Bureau of Forestry, and programs to preserve “high quality waters” were deferred to the Pennsylvania Fish Commission. In 1995, integrated and cooperative action to protect the environmental quality of state forests was further hampered when the DER was abolished, and its functions separated into two agencies, the Department of Environmental Protection, charged with enforcement of state environmental laws, and the Department of Conservation and Natural Resources, responsible for the management of state parks and state forest lands.

Hays argues that state forest management in Pennsylvania “was dominated by a network of interacting institutions including the forest industry, the forest profession, state forest managers, consulting foresters, and forest academics, all of which gave only weak or no support to environmental and ecological forest activities” (2007: 124). This supported a persistent emphasis on commodity wood production within the Bureau of Forestry to the exclusion of other objectives such as the promotion of recreation, watershed management, and biodiversity. The close alliance between the Bureau of Forestry and the wood products industry received little challenge from the public. Between 1970 and 1990, Samuel P. Hays participated as an academic expert in numerous state forest planning meetings and commissions in Pennsylvania. He notes that environmental advocacy organizations (EAO), such as the Audubon Society, the Pennsylvania Wildlife Federation, and the Chesapeake Bay Foundation were rarely present at Bureau of Forestry planning meetings. While the Pennsylvania Chapter of the Sierra Club advocated for ecological forest policies, it had little success in stimulating interest among the public or state officials. The Western Pennsylvania Conservancy, which played an important role in the acquisition of state forest lands in the 1960s and

1970s, became closely aligned with the state's commercial wood products industry. By the 2000s, the Bureau of Forestry increasingly faced pressure to expand recreation and participate in ecological initiatives. However, at the time of the Marcellus Shale gas boom, state forest management in Pennsylvania continued to be dominated by a "commodity wood enterprise" culture.

On the surface, the fact that state forest management in Pennsylvania emphasized commodity wood production may appear irrelevant to a narrative about carbon dependence. However, the example illustrates that historical resource dependence associated with coal mining had a broad influence on Pennsylvania's environmental policy field. It also provides a stark contrast with New York State, where the majority of state forest lands are classified as "forever wild" and prohibited from logging, mining, and oil and gas development. The preservation of New York's state forests is further described in the following paragraphs. The next section offers another example of carbon dependence in Pennsylvania, one related specifically to energy policy.

#### *The Pennsylvania Alternative Energy Portfolio Standard*

The Alternative Energy Portfolio Standard (AEPS) illustrates how resource dependence continues to shape environmental policy in Pennsylvania. The AEPS is Pennsylvania's version of a renewable energy portfolio standard (RPS), and was adopted in 2004 under democratic Governor Ed Rendell. RPS policies seek to encourage the development of renewable energy and reduce greenhouse gas (GHG) emissions by requiring utility companies to source a certain portion of the energy they generate and sell



from renewable sources such as wind and solar. By 2007, 23 states and the District of Columbia had adopted an RPS, and in 2017, this figure had grown to 29 states (Rabe 2007; Barbose 2017). The substitution of “alternative” for “renewable” energy in the title of Pennsylvania’s RPS policy is notable. In 2004, when Pennsylvania adopted the policy, it was the only state to include fossil fuels (i.e., coalmine methane, waste coal, and integrated coal gasification) in its RPS (Heeter and Bird 2012). This expansive definition of eligible energy sources was highly controversial. The inclusion of waste coal, in particular, presented a potential threat to the legitimacy of the policy since it is a non-renewable resource. A consideration of how waste coal came to be included in the AEPS indicates that resource dependence supported the development of more lenient environmental policies in Pennsylvania.

The AEPS requires that alternative sources provide 18% of Pennsylvania’s energy by 2020. It further divides this 18% into two tiers. Eight percent must come from Tier I energy sources, which include wind, solar, biofuel, and coal-mine and landfill gases. Ten percent must come from Tier II sources comprised of energy efficiency, citizen generation through net metering, coal gasification, waste from trash and paper production, and waste coal. Democratic Governor Ed Rendell championed the adoption of an RPS policy, and framed the policy as a way to transform Pennsylvania’s environmental problems into economic growth opportunities. His administration proposed that a RPS would reduce environmental pollution, while diversifying Pennsylvania’s energy supply, lowering energy costs, and stimulating employment in the development of alternative energy technologies.

Rendell's proposal encountered strong resistance from lawmakers and the energy industry. In 2004, Pennsylvania generated about 55% of its electricity from coal (U.S. Energy Information Administration 2018), and had thirteen waste coal generating plants operating within the state (Glenna and Thomas 2010). Energy companies lobbied against the RPS policy, emphasizing that it would increase energy prices, and harm Pennsylvania's economic competitiveness. In response, Governor Rendell and Kathleen McGinty, the Secretary of the Department of Environmental Protection, built a coalition to support the policy, a coalition that included waste-coal utility companies (Glenna and Thomas 2010).

Environmental advocacy organization (EAOs) strongly criticized concessions to the energy industry, and challenged the categorization of waste coal, a fossil fuel, as a renewable energy source. Governor Rendell and Secretary McGinty managed this legitimacy problem through a rhetorical maneuver that reframed waste coal as an "alternative" and "clean" energy source with environmental benefits that were on par with renewable sources such as wind or solar (Glenna and Thomas 2010). Secretary McGinty argued that the burning of waste coal was cleaner than traditional coal, and environmentally beneficial because it helped to remediate an existing source of pollution. Waste coal is a discarded-by-product of coal mining that can be found in large barren piles throughout Pennsylvania. Waste coal piles are not only visually unappealing and a barrier to land development, but also contribute to acid mine drainage, a major source of water pollution in Pennsylvania. Therefore, Secretary McGinty argued that the burning of waste coal provided significant environmental and economic benefits. Environmental advocates argued that efforts to frame waste coal as a form of "clean energy" failed to

acknowledge that burning waste coal produces toxic fly ash, the disposal of which leads to land and water pollution, or that waste coal may be remediated using other strategies (e.g., planting of beach grass and disposal in lined pits) that leave carbon in the ground. Such arguments were quickly rejected by lawmakers whose comments suggested “an underlying commitment to exploiting a resource whenever the technology allows” (Glenna and Thomas 2010: 866).

Although the inclusion of waste coal seemed to contradict the main objective of a RPS policy, which is to reduce GHG emissions, Pennsylvania policymakers maintained the policy’s legitimacy by distinguishing between “alternative” and “clean”, and “renewable” energy. Yet, policy framings indicated that decision-makers were guided by an interest in resource extraction, energy diversification, and economic development more so than environmental protection. Interestingly, Pennsylvania’s AEPS, which state-based environmental groups labeled the “the dirtiest RPS” in the nation, was championed by a democratic administration. Governor Ed Rendell and Secretary Kathleen McGinty would display a similar deference towards resource extraction a few years later when the Marcellus Shale gas boom unfolded in 2007.

### *A path of carbon dependence*

Throughout the 19<sup>th</sup> century and early twentieth century, Pennsylvania's coal resources provided significant employment in mining, and gave rise to a dynamic industrial economy. While the direct economic influence of coal declined in the later half of the twentieth century, the coal industry had an enduring legacy within the state. The contemporary relevance of Pennsylvania's coal history has typically been seen through the lens of local coal mining communities. Books such as *The Face of Decline* by Thomas Dublin and Walter Licht (2005) and *Coal Dust on Your Feet* by Janet MacGaffrey (2013) consider the economic devastation that coal mining communities such as Scranton, Hazleton, and Shamokin experienced during the slow collapse of the anthracite mining industry. These histories document the exploitative nature of the coal industry, and coal mining communities' strategies of resistance, and illustrate how this legacy continues to shape local identity and culture, and inhibit economic development. Few studies have considered the broader influence of Pennsylvania's coal mining past on state politics.

RPS policy and state forest management policy show that deference towards extractive industries was an enduring feature of natural resource policy in Pennsylvania. State forest management in Pennsylvania was typified by close alliances between industry and government officials, and poor cooperation and integration among agency programs. The result was a state forest management system focused on commodity wood production rather than ecology and biodiversity. Pennsylvania's RPS policy demonstrates the political influence of energy producers, and a pattern of viewing environmental problems in terms of economic growth. Both examples suggest that Pennsylvania

possessed a conservative and relatively weak environmental movement. These examples indicate how the historical importance of extractive industries in Pennsylvania, particularly coal mining, placed this state on a path of carbon dependence. The following chapters will show how this supported a trajectory of shale policy development that prioritized resource extraction over environmental protection. The next section considers how an alternative path of environmental preservation emerged in New York State.

### *Environmental Preservation in New York*

The relative absence of extractive industries in New York State allowed an environmental history to unfold that was quite different from the one observed in Pennsylvania. Although the lumber and wood pulp industries caused widespread deforestation in New York between 1850 and 1910, these were the last extractive industries to significantly influence the state. Coal mining did not occur in New York, and the little oil and gas drilling that took place did not have a long term impact on the state's environment or economy. This and other unique features of New York's natural environment and political geography provided a pathway for environmental preservation. In particular, the cultural and economic importance of New York City was an important condition for path dependence. From the middle of the nineteenth century to present day, New York City's urban elite played a significant role in fostering the preservation of natural areas throughout the state. The establishment of the Adirondack and Catskills Forest Preserves as "forever wild" in the 19<sup>th</sup> century provides one example of the preservationist impulse in New York State. The development and management of New

York City's water supply system offers another. Each of these factors contributed to a policy context in New York State that favored political resistance to unconventional oil and gas development following the Marcellus Shale gas boom.

### *Forest preservation*

New York State established the Adirondack and Catskill Forest Preserves in 1885—six years before a national policy to create federal forest reserves was put in place. These forest preserves were created and came to be protected as “forever wild” through a unique alignment of environmental and business interests among New York City's wealthy elite. While cultural and artistic currents of the time created an enthusiasm for the wilderness, application of the scientific method led nature to be seen as a source of health and economic benefits, which could be protected through conservation and expert management. Together these trends supported an ethic of land protection that had an enduring influence on environmental policy in New York State. Just as state forest management in Pennsylvania reflected a culture of resource extraction, forest preservation in New York shows how the state's identity came to be linked to the natural landscapes it contained; how its “mountains, lakes, rivers, expansive forests, as well as spas, hotels, and historic homes [became] places worth knowing—and protecting” (Stradling 2010: 105).

New York City was the center of American romanticism, a 19<sup>th</sup> century cultural and intellectual movement that venerated nature's beauty and power. Famously depicted in the landscape paintings of Thomas Cole and the Hudson River School, the Catskill

mountains and Hudson Highlands became known as wild and romantic destinations, and in the 1820s and 1830s, attracted wealthy tourists who sought an emotional connection with nature. Similarly, writers, such as James Fennimore Cooper, whose “Leatherstocking Tales” romanticized frontier life, instilled in urban dwellers longing for a wilderness that was rapidly succumbing to the forward march of progress. At the same time, a growing middle class could afford the time and expense of travel, and tourism emerged around the exploration of an increasingly domesticated wilderness. Rail line expansion and construction of the Erie Canal brought visitors to popular destinations such as Saratoga Springs, Niagara Falls, and the Catskill Mountain House, where visitors could experience nature at a distance in fine hotels and spas (Stradling 2010). By mid-century, adventurous travelers were heading farther afield to the Adirondack Mountains, an area that remained largely unsettled and unknown. Here in more rustic accommodations, highly cultured men sought freedom in wilderness through hunting, fishing, and guided adventures that gave them a taste of primitive life. In short order, the northern woods became a pleasure ground for the gentry as wealthy families bought large tracts of land and constructed mountain lodges (Edmondson 2001).

Throughout the 19<sup>th</sup> century, travelers escaped the city not only in search of the sublime, but to experience the health benefits that were increasingly associated with nature. Air pollution, water pollution, and overcrowded housing accompanied the growth of industrial cities, and contributed to disease and poor public health. Poor sanitation in the slums of New York led to regular outbreaks of cholera and typhus, which easily spread to wealthier sections of the city. High population density contributed to the spread of tuberculosis, a condition quickly worsened by the coal smoke and soot blanketing

industrial cities. Conditions became even more oppressive in the heat of summer, and drove the wealthy and middle class to the countryside in search of clean water and fresh air. Scientific advancements in bacteriology further supported the idea that disease was associated with unclean environments. In particular, the discovery that cholera was caused by a bacteria spread through human wastes strengthened efforts to expand public water systems. Within this context, forest preservation acquired practical significance as a means to protect public water supplies.

Romanticism and a scientific approach to nature also influenced other areas within the United States. However, few places exemplified these trends like New York State. New York featured prominently on the American Grand Tour, in part because the Erie Canal facilitated travel to Niagara Falls (Stradling 2010). Along the way, various other points of interest were promoted as tourist attractions. In Pennsylvania, the rail road brought mountains of coal from the wilderness into urban centers. In New York State, the path was reversed as rail line expansions brought well-healed tourists to pristine summits, mineral spas, and historic sites. Within the United States, scientific advancements in public health and municipal water systems began in New York City. Tremendous water demand led the city's urban elite to develop an interest in preserving the environmental quality of rural areas upstate. As the 19<sup>th</sup> century came to a close, these trends combined with the advent of forestry science to support the establishment of the Adirondack and Catskill Forest Preserves.

By 1870s, the lumber boom and the general expansion of civilization into the North Woods had a noticeable impact on supplies of wood, wildlife, and water. Rapid deforestation not only threatened wilderness recreation. Piles of brush from recently



logged lands provided tinder for massive fires that periodically tore through the countryside. A drought cycle that peaked in 1883 also helped to create a popular impression among mainstream New Yorkers that “fires, erosion, and logging were drying up the land” (Edmondson 2001: 14). During this period, forest preservation began to be associated with watershed protection, a link that was decisive for garnering support for a proposal to create the Adirondack Park. In the mid-nineteenth century, New York State dominated the North American economy largely because of freight traffic through the Erie Canal. To float barges through the canal and the Hudson River to New York City required a sufficient water supply. More importantly, abundant clean drinking water was necessary to support the city’s rapidly expanding population. During the drought of 1883, the threat that water shortages posed to New York City became readily apparent, and led the state Chamber of Commerce to support forest preservation.

A coalition of nature tourists, naturalists, physicians, and business interests helped support the creation of the Adirondack and Catskill Forest Preserves in 1885. The Forest Preserve originally included 681,000 acres in the Adirondacks and a little under 34,000 acres in the Catskills (Stradling 2010). Although the initial decree defined the Forest Preserve as “wild land”, it took a some time for the preservationist impulse to be fully incorporated into state land management. The state continued to sell timber rights within the the Forest Preserve, and logging on state land was often sloppy and destructive. In 1894, an amendment to the New York State Constitution declared that the Forest Preserve “shall be kept as forever wild forest lands” and prohibited their lease, sale, and exchange, and the removal of timber. While this protected a huge swath of land, logging and urban sprawl continued to threaten the forests of New York throughout the early

twentieth century. During the 1960s, there was renewed support for forest preservation, and significant funds were dedicated to the expansion of the Forest Preserve, and the acquisition of other state forest lands. Today, the Adirondack Park encompasses 2.6 million acres of state land, while the Catskill Park consists of 287,5000 acres. The state possesses an additional 1.1 million acres of forest land that is managed under different designations (i.e., State Forests, Wildlife Management Areas, Unique Areas, and State Nature and Historic Preserves), some of which may be leased for natural resource extraction. Nevertheless, with about a third of state lands retained in forest preserves, New York took a markedly different approach to state forest management than Pennsylvania.

### *The New York City watershed*

During the late 19<sup>th</sup> century, water supply demands helped foster an ethic of forest preservation among New York City's elite. At the close of the 20<sup>th</sup> century, New York City's water supply system continued to provide a mechanism for land preservation. New York City has the largest unfiltered water supply in the United States. In the 1990s, the City faced pressure from state and federal regulators to build water filtration facilities. The City was able to avoid the significant costs (estimated at \$6-9 billion) associated with the construction of a water filtration system by implementing an innovative system of watershed management. This system solidified elite interests in preserving the environmental quality of New York City's rural watersheds, and strengthened the linkages and interdependences between the state's urban and rural areas. This section

briefly outlines how a unique watershed management system evolved in New York City. This provides another example of how a path of environmental preservation endured in New York State, and establishes a context for understanding the significant role that New York City played in the development of political opposition to unconventional oil and gas development and fracking.

The Croton Watershed and the Catskills/Delaware Watershed are the two primary sources of New York City's drinking water. Together, these watersheds encompass 1,900 square miles in eight counties and provide over a billion gallons of water daily to the residents of New York City, and surrounding counties (Glenna 2010). A complex system of reservoirs, aqueducts, and underground tunnels transports water to the city from as far as 125 miles from the water's source. The present day system was established slowly overtime as increasing water demands led New York City to expand its water supply infrastructure. The City first began obtaining municipal water from the Croton watershed in 1842. In 1905, the New York State Legislature granted the City significant powers to expand and protect its water supply by securing private land through eminent domain. These powers were used to extend the City's water supply system first into the Catskill Mountains, and then, into the Delaware River watershed. Throughout most of the twentieth century, management of the City's water system followed a pattern of technocratic, centralized control that fundamentally disadvantaged rural areas (Pires 2004). Rural and suburban watershed communities had few opportunities to participate in decision-making about the construction of reservoirs and dams, and landowners received minimal compensation for the expropriation of their property. This provides yet another example of the economic and political influence of New York City within the state.

In 1953, updated legislation somewhat improved the political leverage of watershed residents by requiring New York City to compensate residents for all of the economic damages caused by the environmental regulation of watersheds (Glenna 2010). This policy change did not have much immediate impact, in large part, because New York City sought to avoid increased costs by limiting its enforcement of regulations (Finnegan 1997). However, in 1992, revisions to the Safe Water Drinking Act, which mandated that water supply systems filter all surface water, led New York City to take a more active role in watershed management. The City obtained an exemption from federal filtration requirements provided that it maintained a watershed management program. As the City planned to increase regulation of septic systems and water runoff from farms and businesses and limit the building of impervious surfaces (buildings and pavement) within the watershed, a coalition of town supervisors in the watershed (Coalition of Watershed Towns) formed to oppose the program, which would have placed the economic costs of water protection on them (Glenna 2010). Since watershed communities had legal standing to sue for economic damages, they were able to negotiate with the City for a more inclusive rulemaking process. To resolve the conflict, New York Governor George Pataki organized an environmental mediation process that included all relevant stakeholders.

After two years of negotiations, a memorandum of agreement (MOA) was signed in 1997 by New York City, the State of New York, the U.S. Environmental Protection Agency, 73 local municipalities and eight counties in the watersheds, and five environmental organizations. The MOA provided the basis of a watershed management system with three main components: 1) New York City would contribute \$250 million to

a Land Acquisition Program that would be used to buy land titles and create conservation easements within sensitive areas on a “willing buyer/willing seller” basis and the City would pay the property taxes on its development potential, 2) Watershed Rules and Regulations would be adopted to ensure the long-term protection of the water supply, 3) New York City would provide economic development and environmental cleanup funds to support programs that preserve water quality, as well as, those that improve the economic and social character of watershed municipalities.

For the purposes of this research, the MOA is important because it reproduces two patterns associated with a path of environmental preservation in New York State, and links the narrative of path dependence to a modern chain of events. First, New York City elites pursued their interest in maintaining the environmental quality of rural watersheds through a policy of land preservation. The MOA included significant funds for this purpose and set a goal of purchasing 355,201 acres of undeveloped land to be kept vacant in perpetuity. Second, the agreement strengthened the interdependence and institutional linkages between rural and urban areas. While New York City relied on watershed communities for a clean water supply, watershed communities derived significant funds and technical assistance from the City. The creation of the Catskill Watershed Corporation, an economic development organization created out of the Coalition for Watershed Towns, institutionalized this relationship and formalized what had long been a historical reality. The cultural and economic fate of the mid-Hudson region of New York, which includes the Croton Watershed and the Catskills/Delaware Watershed, was tied to that of New York City.

Although the history of New York City's water supply management system involves only a small area of Upstate New York, it exemplifies how the City dominates the culture and political economy of the state. This arrangement also directly shaped the environmental controversy over unconventional oil and gas development and fracking in New York. The potential for drilling within New York City's watershed provided the anti-fracking movement with a large constituency, and led a politically influential set of actors to join the state's anti-fracking coalition. Chapter Three will examine in greater detail the role that New York City interests played in the political opposition to fracking, and how this influenced shale policy development in New York. For now, this discussion provides an example of how New York's path of environmental preservation endured.

#### *A path of environmental preservation*

New York State played an important role in the industrialization of the United States. During the 19<sup>th</sup> and early 20<sup>th</sup> century, it rose to become an important financial and manufacturing center, in large part, due to the influence of New York City. However, unlike Pennsylvania, New York did not possess significant energy resources. As a result, the state was much less dependent on extractive and energy-intensive industries. Rather, New York's early economic development was closely tied to its dominance over trade routes. In particular, construction of the Erie Canal supported the economic expansion of New York, and led New York City to become an economic and cultural capital of the United States. In the late 20<sup>th</sup> century, deindustrialization and the transition to a service-based economy presented New York with significant challenges. Yet, in the 21<sup>st</sup> century,

New York City remained a global center of capital and the dominant force shaping the culture and political economy of New York State. Urban influence and the relative absence of extractive industries were the central factors that contributed to a path of environmental preservation in New York.

The idea of environmental preservation proposed in this research is, of course, a relative one. The settling of New York, industrialization, and the general expansion of modern civilization fundamentally altered the nature of New York. In absolute terms, very little of the state's natural environment has been preserved. Like Pennsylvania, New York suffered massive deforestation in the 19<sup>th</sup> century, and in the modern era, was a dumping ground for hazardous chemicals. One cannot ignore that Love Canal, one of the nation's most infamous environmental disasters, occurred in New York. Certainly, modern issues of ecological degradation continue to plague the state. Nevertheless, at various points in the state's history, circumstances fostered an ethic of environmental preservation among elites that had significant consequences for governmental policy. The establishment of the Adirondack and Catskill Forest Preserve, and New York City's watershed management system show how the interests of urban elites contributed to a path of environmental preservation in New York. Had the state experienced the environmental devastation associated with fossil fuel extraction, it is unlikely that such interests would have emerged. The following chapters will show how New York's environmental preservation path contributed to a trajectory of shale policy development that privileged environmental interests over those of energy companies. I conclude the current chapter by returning to the argument for a minimalist approach to path dependence.

## THE CASE FOR A MINIMALIST APPROACH TO SHALE POLICY PATHS

Students of public policy, and of social and political life more generally, commonly recognize that “history matters.” Within the social sciences, path dependence is an important metaphor for understanding how a historical sequence of events may influence how a later sequence of events unfolds. The quest for scientific rigor has led many social scientists to argue for a strong version of path dependence understood as a process in which an initial event or sequence of events sets in motion a self-reinforcing process that strongly determines later sequences of events (Djelic and Quack 2007; Howlett 2009; Mahoney 2000; Pierson 2000). In this chapter, I have argued for a minimalist approach that makes fewer assumptions about the structure of path dependent sequences or the causal processes that produce them. A minimalist path dependency narrative is particularly appropriate for understanding shale policy divergence in New York and Pennsylvania. I conclude Chapter Two by reiterating the benefits of a minimalist approach to path dependence, and highlighting its suitability for this research.

Strong path dependency narratives typically center on the institutionalization of a historical pattern that emerges following a critical juncture. This involves a historical break in causation when distinct temporal processes and conditions come together to foreclose some options and favor others. Institutional arrangements are placed on a particular path or trajectory, which persists as social actors, operating under a given set of rules and opportunity structure, pursue courses of action that reproduce the original pattern. In Chapter One, I noted that the emphasis on critical junctures and positive feedback mechanisms has led some scholars to criticize the concept of path dependence and develop alternatives such as “reiterated problem solving” or process sequencing



(Haydu 1998; Howlett 2009). These scholars argue that path dependency narratives are overly deterministic, provide a narrow view of history, and offer little insight into moments of institutional transformation. While I agree with these criticisms, I argue that a minimalist approach to path dependence avoids these issues, and should be retained since it is a powerful metaphor for constructing historical narratives.

Proponents of strong theories of path dependence often equate minimalist narratives with an ambiguous form of historical explanation. The dominance of this view has even led critics of the concept to dismiss minimalist approaches as a form of “mundane historicism.” However, minimalist theories of path dependence are a legitimate form of historical explanation, one that has advantages over the dominant approach. By avoiding strong theoretical claims about the causal mechanisms that produce a historically determined sequence of events, minimalist versions of path dependence can incorporate multiple casual trajectories into a common narrative. As a result, the approach is more flexible and can provide greater insight to more encompassing sequences that contain multiple turning points. A minimalist approach to path dependence is particularly useful when the outcome to be explained involves a combination of historical influences (e.g. cultural and structural continuities, social learning, balance of power shifts, and collective action) with diverse and disconnected temporalities.

Shale policy divergence in New York and Pennsylvania exemplifies the kind of cases for which a minimalist approach to path dependence is most appropriate. The fact that these states took such different approaches to shale gas drilling and fracking must be understood against a backdrop of longstanding historical differences in natural resource

extraction and urban influence. Coal mining had a lasting impact on Pennsylvania's environment, culture, and political economy. This legacy created a political environment that was favorable towards extractive industries and likely to support the rapid expansion of unconventional oil and gas development. Of the two states, shale policy development in Pennsylvania most closely resembled a strong account of path dependence in that it involved the reproduction of an institutionalized deference towards resource extraction. Nevertheless, Pennsylvania's shale policies were not simply a product of resource dependence. They were produced by social actors who operated within a decision-making context shaped by existing policies, shifts in political party control, and collective action. Subsequent chapters will describe how these factors interacted to produce an event cascade that, while contained by a broader narrative of carbon dependence, also displayed emergent and dynamic properties.

New York's trajectory of shale policy development presents a greater challenge to strong versions of path dependence since the state's decision to ban fracking actually involved the disruption of pre-existing institutional arrangements. New York's oil and gas regulations were primarily established using an environmental impact statement (EIS), a process without equivalent in Pennsylvania. The EIS process granted regulators in New York a potentially stronger mechanism for addressing the environmental impacts of oil and gas development. Yet, prior to the Marcellus Shale gas boom, New York and Pennsylvania's oil and gas regulations were quite similar. Before the fracking controversy, the policy status quo in New York was supportive of increased oil and gas development. Shale policy development was path dependent in New York not because positive feedback reinforced existing policy institutions, but because a coalition of

influential political actors were able to draw the fracking issue into a broader pattern of environmental preservation. Historically, the relative absence of extractive industries in New York combined with the economic and cultural interests of New York City elites to support an ethic of land preservation. At various points in the state's history, this ethic prevailed over environmental policy. Subsequent chapters will describe how the structure of political interests, strategic collective action, and the calculations of political decision-makers contributed to a trajectory of shale policy development in New York that again reproduced this general path of environmental preservation.

## CHAPTER THREE

### PUTTING ANTI-FRACKING MOBILIZATION IN CONTEXT: A HISTORICAL ANALYSIS OF DIVERGENT MOVEMENT TRAJECTORIES IN NEW YORK AND PENNSYLVANIA

Unconventional drilling and fracking within the Marcellus Shale spurred environmental opposition in New York and Pennsylvania. Although anti-fracking movements emerged in both of these states, these movements followed very different trajectories. In New York, preemptive mobilization forestalled the shale gas boom and led to an anti-fracking movement that was popular, well-resourced, and politically connected. The Pennsylvania anti-fracking movement emerged after the shale gas industry was already entrenched in the state. Anti-fracking mobilization in Pennsylvania was dispersed, poorly integrated, and politically marginalized. I argue that distinct histories of resource extraction and urban influence were determinative of divergent mobilization trajectories in these states. In Pennsylvania, a legacy of resource extraction and a conservative political culture contributed to greater public support for the shale gas boom, and limited the political opportunities of environmentalists. Resource extraction was never a major industry in New York. As a result, shale field residents in this state were more apprehensive about the shale gas boom. In New York, a historical pattern of environmental preservation also gave liberal elites based in New York City reasons to oppose drilling in rural areas. This chapter describes the emergence of the anti-fracking movement in New York and Pennsylvania, and illustrates how these very different mobilization contexts shaped movement trajectories.

Research on community responses to unconventional drilling and fracking shows that there are significant barriers to anti-fracking mobilization in energy dependent states. Case studies of communities within the Barnett Shale in Texas (Auyero, Hernandez, and Stitt 2017; Gullion 2015), the Haynesville Shale in Louisiana (Ladd 2014a,b; Ladd 2018), and the Marcellus Shale in Pennsylvania (Eaton and Kinchy 2016; Hudgins 2013; Malin and DeMaster 2016) found that, where extractive industries were historically dominant, concerned citizens struggled to collectively frame grievances and form oppositional movements. Few studies have considered how extractive histories shape the organizational bases of mobilization or the discursive and political opportunity structures of anti-fracking movements at the state-level. Studies of local anti-fracking mobilization within the Texas Barnett Shale found that community activists encountered hostility from local politicians, and faced pressure to conform to the dominant policy frames that favor the industry and scientific experts (Auyero et al. 2017; Gullion 2015). Similar dynamics likely limit the discursive and political opportunity structures of anti-fracking movements statewide in energy dependent states. This chapter contributes to the anti-fracking movement literature by offering to my knowledge the first comparative analysis of movement trajectories within an intense resource extraction state (Pennsylvania) and a state without major extractive industries (New York).

This study argues that state histories fundamentally shaped anti-fracking movement trajectories, but that historical influence must be conceived as contextual and interactive rather than simply determinative. New York and Pennsylvania's extractive and environmental histories provided activists with a unique set of opportunities and constraints. However, ultimate movement trajectories were achieved by the activists who

navigated these political landscapes. To show how this was accomplished, I examine grassroots anti-fracking organizational foundings and movement framings, and analyze the interactions between grassroots anti-fracking mobilization and professional environmental advocacy in each state. In particular, I argue that strategic collective action by grassroots and professional EAOs helped to expand the supply of protest opportunities and support movement expansion. Specifically, I examine how professional and grassroots EAOs worked together to mount public information campaigns, and consider how this supported the development of local anti-fracking EAOs. Public information campaigns were one way that activists expanded the supply of mobilization opportunities. Organizing participation in public comment periods and protest events was another. All of these activities provided the chance for closer communication and interaction between professional and grassroots EAOs. This research offers some preliminary insights into the nature of these interactions, and how they shaped movement trajectories in New York and Pennsylvania.

This study uses thick description to show how divergent movement trajectories in New York and Pennsylvania were determined by the particular ways that strategic actions and other contingencies interacted with pre-existing structures as sequences of events unfolded overtime. The courses taken by the New York and Pennsylvania anti-fracking movements were each unique. Nevertheless, state movement trajectories are only intelligible against the backdrop of each state's extractive and environmental history. By comparing anti-fracking mobilization in states with and without histories of resource extraction, this research helps to identify the particular challenges that environmental activists in energy dependent states face.

The next section describes how previous research on the anti-fracking movement informs the current study. This is followed by a discussion of the data and analytic approach. Next, I provide a brief overview of the New York and Pennsylvania anti-fracking movements. Then, I compare these states' extractive histories and discuss how this influenced the context of mobilization. This is followed by a historical analysis of movement emergence, and an assessment of the discursive and political opportunity structures encountered by activists in New York and Pennsylvania. I conclude the chapter by summarizing my findings and discussing the broader relevance of this study.

## LITERATURE REVIEW

Two broad areas of research on the anti-fracking movement are relevant to this study. First, studies of local responses to the shale gas boom indicate that familiarity with extractive industries tends to decrease community resistance to unconventional drilling and fracking. A review of the community response literature helps to specify the contextual differences between New York and Pennsylvania, and provides support for the idea that anti-fracking mobilization was partly determined by each state's history of resource extraction. In Pennsylvania, a conservative political culture and a legacy of resource extraction likely contributed to greater public support for UOGD, and limited the political opportunities of local environmentalists. By contrast, New York's path of environmental preservation and liberal political base was more conducive to anti-fracking mobilization.

Second, studies of anti-fracking mobilization highlight how movement trajectories are shaped by the interaction between strategic collective actors and their mobilization contexts. Studies of strategic action and institutional entrepreneurship show that a range of factors influence the tactics of anti-fracking activists and organizations, including public discourse and cultural products, supply-side factors, organizational challenges, and counter-mobilization by opponents and political elites. A review of this research suggests that activists in states with intensive resource extraction may develop different movement frames and tactics than activists in states with limited resource extraction. This research also indicates that efforts to expand the supply of protest opportunities may be crucial to movement expansion. In particular, research on supply-side mobilization supports further examination of how activists used public information campaigns, mass protests, and other collective activities to expand the movement.

### *Fracking, Community Response, and Oppositional Mobilization*

The rapid expansion of UOGD throughout the United States has inspired a significant amount of research that seeks to understand how local stakeholders perceive, frame, and respond to the risks of shale drilling (Auyero et al. 2017; Eaton and Kinchy 2016; Gullion 2015; Hudgins 2013; Jerolmack and Walker 2018; Ladd 2014a,b; Ladd 2018; Malin and DeMaster 2016; Neville and Weinthal 2016). This literature suggests that political and cultural values, and past legacies of resource extraction are important factors shaping community responses to the shale gas boom. Support for UOGD is likely to be higher in communities that are more conservative politically and have longer



histories of natural resource extraction. By contrast, opposition to fracking is likely to be greater in communities that are politically liberal and have little experience with extractive industries. These factors probably go a long way in explaining why grassroots anti-fracking mobilization was much greater in New York than in Pennsylvania.

Pennsylvania tends to be more politically conservative than New York, and as a major coal producer, has been more strongly influenced by natural resource extraction. Previous research on community responses to UOGD and fracking provide a useful context for understanding distinct trajectories of anti-fracking mobilization in these states.

Shale field residents typically recognize that UOGD entails some risk.

Nevertheless, many also believe that the industry offers numerous economic benefits that outweigh its negative impacts. Thus, some have argued that shale field residents see UOGD as a “double-edged sword” (Ladd 2018) or a “devil’s bargain” (Malin and DeMaster 2016). Environmental justice scholars tend to see the lack of oppositional mobilization in many shale field communities as a product of economic vulnerability and feelings of powerlessness (Eaton and Kinchy 2016; Hudgins 2013; Malin and DeMaster 2016). Yet, support for UOGD is a meaningful position that may be consistent with the political beliefs, cultural values, and perceived self-interest of local residents (Jerolmack and Walker 2018). The environmental justice and social movement literatures tend to assume that a lack of resources, opportunity, and effective frames prevent those exposed to environmental risks and industrial pollution from mobilizing in opposition. However, mobilization in support of the industry may actually be more important for understanding community responses to fracking within many shale fields.

The reality is that the groundswell of anti-fracking mobilization observed in New York is an exception to the rule. While local anti-fracking movements have emerged in every U.S. shale gas play, these movements are rather small. Studies of the Marcellus Shale in Pennsylvania (Eaton and Kinchy 2016; Hudgins 2013; Malin and DeMaster 2016), the Haynesville Shale in Louisiana (Ladd 2014a,b; Ladd 2018), and the Barnett Shale in Texas (Auyero et al. 2017; Gullion 2015) consistently find substantial barriers to the collective framing of grievances and local oppositional mobilization. A forthcoming paper by Jerolmack and Walker (2018) argues that a lack of oppositional mobilization in shale field communities should be viewed as “quiet mobilization,” rather than non-mobilization or quiescence. They conceptualize quiet mobilization as involving conventional forms of engagement in civil society (e.g., everyday conversations, attending local civic meetings, and forming interest groups). Using ethnographic research, they demonstrate how residents of a rural Pennsylvania community within the Marcellus Shale engaged in “quiet mobilization” that supported a positive social construction of shale gas drilling. Particularly in rural communities, where shale drilling tends to occur, such forms of civic engagement may be better aligned with community norms of civility than the oppositional tactics commonly associated with social movements.

Many shale field communities are located in regions where conservative political values dominate, distrust of the government runs high, and personal sovereignty and individualism are prized. Natural resource extraction has also significantly shaped the political economy of every major shale producing state, except New York. Ethnographic research and personal interviews with shale field residents indicate that these are relevant

factors shaping community responses to UOGD (Eaton and Kinchy 2016; Jerolmack and Walker 2018; Guillion 2015; Ladd 2018). Jerolmack and Walker (2018) found distrust of government agencies to be so strong among rural landowners in Pennsylvania that even those who had their water wells contaminated by drilling opposed additional environmental regulations. Eaton and Kinchy (2016) also interviewed rural landowners in Pennsylvania, and found that the value of individualism shaped residents' support of private land leasing. In the Haynesville Shale in Louisiana, Ladd (2018) observed that residents referenced the state's long history of oil and gas development and their personal experience with the industry to justify their support of fracking. Gullion (2015) found that suburban opponents to fracking in the Barnett Shale were "reluctant activists" who dissociated from "environmentalists" and experienced their activism as being in conflict with their conservative identity.

Even in New York, where resource extraction is not a significant industry, there is evidence that community political composition and the historical presence of the oil and gas industry influenced the adoption of local anti-fracking ordinances. Dokshin (2016) examined the passage of anti-fracking ordinances by New York municipalities between 2010 and 2013. He found that towns with a history of oil and gas development were less likely to pass an anti-fracking ordinance. Community political composition, measured as share of votes for state gubernatorial candidates in 2010, was also found to influence adoptions, but this effect was not consistent overtime. At the beginning of the study period, towns with more Democratic supporters were not more likely to pass an anti-fracking ordinance. However, the effect of Democratic vote share increased rapidly overtime as the debate over fracking intensified. (A model that specified Republican vote

share instead of Democratic vote share supports a complementary interpretation that conservative communities became less likely to adopt an anti-fracking ordinance overtime.) Dokshin (2016) also included a measure of mobilization in support of fracking (i.e., landowner coalitions), and found that the presence of a landowner coalition within a community had a significant negative effect on the adoption of anti-fracking ordinances. Findings were similar for the emergence of local ban movements, except for the presence of a landowner coalition, which did not have a significant effect.

Overall, research on community responses to the shale gas boom indicate that distinct histories of resource extraction in New York and Pennsylvania contributed significantly to divergent movement trajectories in these states. Pennsylvania, like Texas and Louisiana, was historically an energy dependent state. The following analyses will show that the historical dominance of coal mining in Pennsylvania left a cultural, economic, and environmental legacy that led many residents to consider the economic benefits of shale drilling to be greater than the environmental risks. In New York, residents' lack of familiarity with resource extraction led to greater concerns over shale drilling's negative impacts.

### *Strategic Collective Action and Institutional Entrepreneurship*

Strategic collective action and institutional entrepreneurship significantly influence the development and outcomes of social movements. Consideration of such factors introduces greater agency and dynamism to structural analyses of political opportunity and resource mobilization, and highlights the relational processes that

constitute social movements. A few studies have sought to understand how strategy, institutional entrepreneurs, and interactions between political actors shaped the anti-fracking movement. This research highlights how the mobilization strategies of fractivists took shape in relation to public discourse and cultural products, supply-side factors, organizational challenges, and counter-mobilization by opponents and political elites.

Vasi et al. (2015) examined how the popular documentary *Gasland* influenced anti-fracking mobilizations and local ban adoptions within Pennsylvania, Ohio, New York, and West Virginia. They found that activists effectively used this documentary to expand the discursive opportunity structure and foster oppositional mobilization. Local *Gasland* screenings contributed to anti-fracking mobilizations, which subsequently, increased the chances that municipalities would adopt a local anti-fracking ordinance. To further understand how discursive strategies shaped mobilization, I examine the social movement framings of local EAOs. In particular, I consider how the creative appropriation of the industry term “fracking” supported negative social constructions of UOGD.

Qualitative research on grassroots activism within the Barnett Shale in Texas also highlights the importance of discursive strategies, and shows how strategic interactions between activists, political elites, and industry representatives shaped oppositional mobilization. Auyero and colleagues (2017) conducted an ethnographic study of the local ban movement in Denton, TX. They found that community members only mobilized to oppose fracking after city officials failed to regulate drilling in highly populated urban areas. Community activists initially engaged in conventional politics, but were pushed towards more confrontational tactics by city officials and industry representatives who

excluded them from policy discussions, as well as radical “fractivists” who sought a total fracking ban (i.e., radical flank effect). This led moderate community activists to campaign for a limited municipal ordinance that only restricted drilling in densely populated areas. Local activists gained support for a local ban by organizing a citizens’ commission to study the issue, holding public meetings, and canvassing locally to raise public awareness about the risks of fracking. While they succeeded in passing the municipal ordinance, it was quickly invalidated by a state law that Texas passed in response. Limited public protest over this decision highlights the challenges of anti-fracking mobilization in resource dependent states. Where political and discursive opportunities are limited, it may be very difficult to maintain mobilization following political defeats.

Gullion (2015) also utilized ethnographic methods to study local anti-fracking mobilization within the Barnett Shale. Gullion examined the strategies of “reluctant” activists who felt compelled to mobilize in response to potential health impacts of fracking within their urban and suburban communities. Gullion also found that activists sought legitimacy by working within the boundaries of conventional politics and conforming to scientific (“positivistic”) standards of knowledge employed by regulators and the industry. There was a reluctance to use confrontational tactics both because this did not “fit” with the conservative identities of activists, and because activists feared reprisals and social ostracism. Local anti-fracking mobilization not only faced a hostile political environment with few opportunities, but was also hampered by divisions among activists, in-fighting, and within group censorship. Activists often criticized other activists who spoke strongly in public, sought media attention, or appeared too “radical.”

Gullion's study highlights a strategic dilemma for fractivists in resource dependent states. In such areas, the economic and political influence of extractive industries and a conservative political culture present barriers to the use of confrontational and "extra-institutional" tactics. Such tactics may not align with the cultural values of activists, and they may be associated with a loss of legitimacy and repression by authorities. Yet, traditional methods of political participation (e.g., testimony at public hearings, petitions, and contacting political representatives) may be less effective for movement building, and less capable of disrupting the status quo. Well-organized protests may effectively garner public attention for a cause, increase pressure on public officials, and provide opportunities for building solidarity. Furthermore, while activists may conform to conventional political and scientific discourse to gain legitimacy, they are often outmatched in contests over scientific knowledge. Gullion found that community activists in the Barnett Shale constantly struggled to have their claims taken seriously.

The tension between confrontational and conventional political tactics may be very relevant for understanding differences between the anti-fracking movement in New York and Pennsylvania. In New York, movement organizers utilized government hearings and opportunities to provide public comment on oil and gas regulations to facilitate movement participation and cultivate the capacities of fractivists. The success of the local ban movement in New York further demonstrates the potential effectiveness of conventional forms of political participation. However, local ban campaigns in New York were part of a broader movement comprising national, state, and local EAOs. In New York, coalitions of professional and grassroots EAOs organized anti-fracking protests

throughout the state. It is difficult to understand the success of the New York anti-fracking movement outside of this broader context. Even in Pennsylvania, where the anti-fracking movement never achieved much scale statewide, a similar dynamic can be observed at the city-level. For example, Staggenborg (2018) found that a successful campaign to hold a major demonstration and pass a local fracking ban significantly strengthened the organizational infrastructure of the anti-fracking movement in Pittsburgh. The political outcome of the New York anti-fracking movement indicates that a combination confrontational and conventional political tactics significantly enhances the political influence of social movements.

Consideration of the dynamics between grassroots and professional mobilization is a major lacuna in the the anti-fracking movement literature. Dokshin and Buday's (2018) study of non-beneficiary constituent mobilization in Illinois begins to fill this gap. The authors draw upon McCarthy and Zald's (1977) idea that the development of a professionalized social movement sector would increase the role that "conscious constituents" play in social movement campaigns. Supply-side theories of mobilization argue that the restructuring of the organizational bases of mobilization towards professional EAOs supports the use of rational technologies and mobilization strategies that target individuals who are ideologically aligned with a cause, not necessarily those who have a direct stake in an issue. To evaluate this argument, Dokshin and Buday (2018) analyze 32,000 public comments on the Illinois Department of Natural Resources implementation of the state's Hydraulic Fracturing Regulatory Act. The authors found that people residing outside the targeted development region submitted the vast majority



of comments opposing UOGD. Furthermore, several large environmental and progressive organizations mobilized the overwhelming share of commenters.

Dokshin and Buday argue that professional EAOs' access to a geographically diffuse membership may facilitate rapid mobilization, but that such tactics limit the durability of social movements. Yet, what if both professional and grassroots EAOs utilize supply-side tactics to support and expand collective action? I argue that this combination presents a powerful strategy for organizing social movements, and that New York's anti-fracking movement provides a successful example. The mobilization potential of professional EAO memberships is limited. Mass mailings and emails provide a means to quickly raise awareness about an issue and disseminate particular framings of a social problem. They may also be used to easily target sympathizers with requests for passive forms of political action (e.g., public comments, petition signing, and fundraising). However, mass mailings and emails are much less effective at promoting and sustaining active forms of engagement in social movements. Local organizational infrastructures provide essential support for the kinds of grassroots person-to-person organizing that is most likely to motivate people to attend public hearings, protest events, and demonstrations.

Research on grassroots social movements rarely focuses on the supply-side of mobilization. Grassroots mobilization is, by definition, driven by local concerns and grievances, and as a result, not typically associated with supply-side factors. Grassroots social movements are often conceived as developing in response to existing demand. In a typical scenario, local citizens transform personal grievances into collective action frames, organize, and if they are effective, a local social movement emerges. Yet, there is

no reason to assume that what Staggenborg calls “movement contributors” are not active at the local-level organizing opportunities to protest, and even, creating demand (2013). This research will show that efforts by grassroots and professional EAOs to expand the supply of protest contributed significantly to the expansion of the anti-fracking movement in New York and Pennsylvania.

Realistically, in both New York and Pennsylvania, most citizens experienced few negative impacts from the natural gas boom. Indeed, even after the Marcellus Shale gained significant media attention, many had little knowledge of UOGD and fracking. Moreover, in areas where drilling occurred, only those residents in close proximity to well pads were likely to be affected by gas well operations. It was fear of the potential impacts of UOGD and fracking that inspired environmental mobilization. Media attention to the risks of fracking helped bring these fears to life. Public awareness campaigns organized by activists at the state and local-level also played a major role. Underlying the “*Gasland* effect” were community activists and professional EAOs who organized local film screenings to raise awareness about the risks of fracking (Vasi et al. 2013). In fact, prior to *Gasland*, local EAOs sponsored screenings of two other films, *Rural Impact!* and *A Land Out of Time*, that documented the negative impacts of the drilling boom in Colorado. Film screenings not only provided a means to disseminate the views of the anti-fracking movement (i.e., consensus mobilization), but also provided incipient fractivists and sympathizers a low risk opportunity to take action (Klandermans 1984; 2004).

This research examines how professional and grassroots EAOs cooperated to sponsor public information campaigns, and considers how this contributed to the

development of local anti-fracking EAOs. In addition to public information campaigns, activists expanded the supply of mobilization opportunities by facilitating participation in public comment periods and organizing protest events. These activities fostered closer communication and interaction between professional and grassroots EAOs. The following analyses provide some preliminary insights into the nature of these interactions, and how they influenced movement trajectories in New York and Pennsylvania.

## DATA AND ANALYTIC APPROACH

This research involved multiple stages of data collection and analysis that sought to understand how distinct histories of resource extraction and urban influence shaped the New York and Pennsylvania anti-fracking movements. This process began by describing mobilization by local anti-fracking EAOs and professional EAOs, and characterizing the relationship between the two forms of social movement activity in New York and Pennsylvania. First, I assessed early resistance to the natural gas boom described in newspaper reports. To analyze grassroots anti-fracking mobilization, I identified the local anti-fracking EAOs that formed in each state, considered the timing and frequency of organizational foundings, and described the location, goals, and social movement frames of these organizations. To analyze professional advocacy, I identified the key national and state-based EAOs engaged in each state's shale policy debate, and examined their policy positions, advocacy efforts, and general relationship to the anti-fracking movement field. I drew upon multiple sources of data including local EAO websites and Facebook

pages, personal interviews, media reports, expert accounts, and government documents. This section briefly describes the primary data sources.

### *Newspaper Analysis*

I began my investigation of movement emergence by reviewing newspaper articles that described local opposition to natural gas drilling, and efforts by environmental organizations to raise awareness about the topic. News articles were located by searching within the NewsBank, Inc. database for the following terms: ("gas well" or "gas drilling" or "hydraulic fracturing" or "fracking") and ("meeting" or "forum" or "workshop" or "seminar" or "movie" or "film" or "documentary" or "protest" or "demonstration" or "oppose" or "opposition" or "concern"). I limited my search to articles published in New York or Pennsylvania between the years 2000 and 2009. I scanned articles and downloaded those that described emergent opposition to natural gas drilling or awareness raising activities by community members or EAOs. These articles were subjected to closer examination that involved coding the location of the emergent opposition or awareness raising event, whether grievances were framed primarily in terms of opposition to locally unwanted land uses (LULU) or environmental risks, and if applicable, the EAOs organizing or participating in the event. This information was used to gain a sense of the timing, location, and character of initial opposition to the natural gas boom in each state.

### *Local Anti-Fracking EAO Founding*

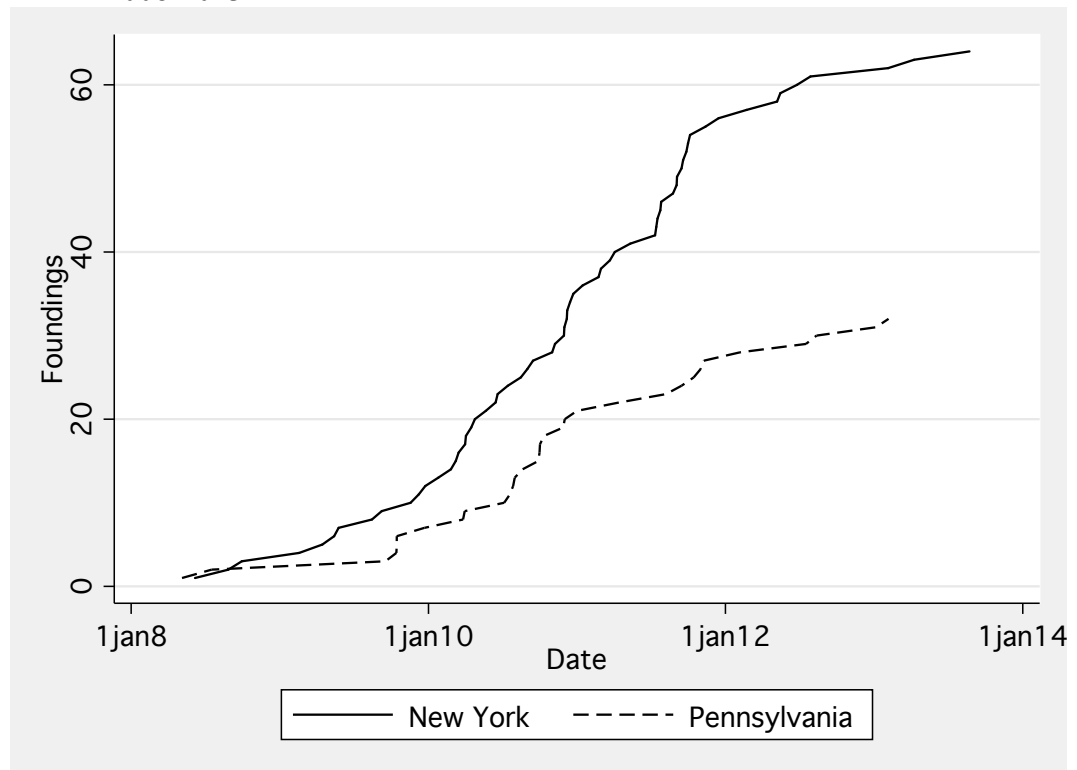
Local anti-fracking EAOs were identified as part of a project to enumerate the population of environmental advocacy organizations (EAO) that mobilized against UOGD within New York and Pennsylvania. I adopted Andrews and Edwards' (2004) definition of advocacy organizations as those making contested claims in the public interest to promote or resist social change. Advocacy organizations were identified using snowball sampling and by referencing citizen testimony at legislative hearings on shale gas development. For the snowball sample, I first identified EAOs sponsoring high-profile events within the Marcellus Shale using newspaper articles in the New York Times, the Pittsburgh Post-Gazette, and the Philadelphia Inquirer. Beginning with this initial list, I snowball sampled EAOs by reviewing websites for lists of additional groups that mobilized against UOGD within New York and Pennsylvania. I proceeded in this manner until failure to identify new organizations indicated saturation.

The snowball sample was collected between April 2013 and September 2013. To supplement the snowball sample, I identified additional EAOs using transcripts of testimony provided at hearings on UOGD held by standing committees of the Pennsylvania and New York State Assemblies between 2008 and 2013. The analysis of local anti-fracking EAOs focuses on a subset of grassroots environmental organizations, which formed specifically to address the environmental risks of UOGD. I utilized movement texts published on websites and Facebook pages to date the founding of local anti-fracking EAOs.

Figure 3.1 displays cumulative foundings in New York and Pennsylvania from 2008 to 2013. This graph shows that, throughout the observation period, New York had

much higher founding rates than Pennsylvania. About twice as many groups formed in New York (N = 64), as in Pennsylvania (N = 32). While local opposition groups began to form as early as 2008, the initial rate of foundings was low for both states. In 2008, three groups formed in New York, and two formed in Pennsylvania. In 2009, New York and Pennsylvania both experienced a slight rise in foundings, however, local anti-fracking mobilization did not take off until 2010, when the number of foundings more than doubled in each state. The higher rate of foundings continued in 2011, but far fewer groups formed in 2012 and 2013, suggesting that the study's timeframe sufficiently captures the population local anti-fracking EAOs.

Figure 3.1 Cumulative Local Anti-Fracking EAO Founding by State, 2008-2013



### *Local Anti-Fracking EAO Framing*

I analyze the collective action frames of local anti-fracking EAOs in New York and Pennsylvania by applying content-analytic methods to political claims data obtained using digital texts from movement websites and social media (Koopmans and Statham 1999). Data collection focused on the initial framing activity of local EAOs. An act of political claims-making (henceforth, a claim) is the unit of analysis. A claim is defined as a strategic action within the public sphere that expresses a political opinion through some form of verbal or physical action, and includes conventional and unconventional forms of expression (e.g., press statements, testimony, petitions, and protests) (Koopmans and Statham 1999). All claims included in this study involve demands, criticisms, or proposals made on the website or Facebook page of local anti-fracking EAOs.

To obtain a baseline, I examined the earliest webpages available on the Wayback Machine Internet Archive. Given the extensive amount of text, manual coding of all speech acts was not feasible. Therefore, I selected textual passages from each homepage, and when available, the “about us” page, and one direct link from the homepage to an act of claim-making. For missing websites, I searched for a Facebook page, and when available, examined the “about” page, and the first ten posts for claims. Next, I reviewed the selected text, and coded each instance of claim-making. If a claim involved several forms of action, the more radical and confrontational act had priority over moderate or demonstrative ones.

I utilized content-analytic methods to provide a systematic and quantitative description of diagnostic and prognostic frames (Franzosi 2009). I began with a coding scheme based on previous research, and a qualitative review of community group

websites, which was modified and expanded based upon observed frame elements. Coding was conducted separately for each aspect of diagnostic and prognostic framing (i.e., problem identification, problem attribution, solution, and tactic). A simple descriptive analysis of these data provided a tool for identifying basic patterns, and generating hypothesis, and helped guide the qualitative analysis of anti-fracking mobilization and framing contained in the following sections.

### *Personal Interviews*

I conducted ten semi-structured interviews with representatives of nine EAOs between July and December of 2013 (See Table 3.1). I targeted local and professional EAOs that played an important role in either New York or Pennsylvania's social movement field. Some EAOs and interview participants were identified at the Freedom from Fracking Conference, which I attended in Philadelphia on September 26, 2013. Others were identified based on the recommendations of interview participants and media reports on the anti-fracking movement. Interviews lasted about an hour and a half, and covered such topics as how EAO representatives came to be involved in the fracking issue, their role and activities with the EAO, their interactions with policymakers and the industry, the challenges they faced, and their general perception of the issues. I recorded and transcribed all interviews, and used a qualitative analysis program to code and analyze the data. These data provided insight on early anti-fracking mobilization by grassroots and professional environmental activists.



Table 3.1 EAO Interviews

EAO	EAO Headquarters	EAO Type
Responsible Drilling Alliance	Williamsport, PA	Local anti-fracking
Protecting Our Waters	Philadelphia, PA	Local anti-fracking
Berks Gas Truth	Kutztown, PA	Local anti-fracking
Delaware Riverkeeper Network	Bristol, PA	Professional EAO
PennEnvironment	Philadelphia, PA	Professional EAO
Catskill Citizens for Safe Energy	Delhi, NY	Local anti-fracking
Coalition to Protect New York	Watkins Glenn, NY	Local anti-fracking
Catskill Mountainkeeper	Youngsville, NY	Professional EAO
Natural Resources Defense Council	New York, NY	Professional EAO

### *Analytic Approach*

This research employs qualitative methods and a process of triangulation to analyze anti-fracking mobilization. Qualitative analysis is an interpretive process that involves stages of describing, organizing, connecting, corroborating/legitimizing, and representing the account (Crabtree and Miller 1999). Triangulation refers to the use of multiple research methods and types of data to answer the same question (Ayoub, Wallace, and Millán 2014). I use textual data, personal interviews, and descriptive analysis of local anti-fracking EAO foundings and framings to construct a timeline of events, characterize opposition to drilling, and describe the structure of anti-fracking mobilization in New York and Pennsylvania. Through triangulation, I establish the credibility of my interpretations by drawing upon multiple forms of data, “accounts” of events, and by comparing across cases (Flick 1992; Seale 1999). The final narrative represents the cumulative understanding that is achieved through iterative stages of describing, comparing, and analyzing mobilization processes across New York and Pennsylvania.

## THE ANTI-FRACKING MOVEMENT IN NEW YORK AND PENNSYLVANIA

This section provides a brief description of the anti-fracking movement in New York and Pennsylvania. I discuss the central issues that led to environmental opposition following the shale gas boom, and describe the variety of collective actors that comprised the anti-fracking movement in each state. In both states, the movement consisted of a diversity of actors from the grassroots and professional environmental communities. I note important differences in the relationship between grassroots and professional collective actors in New York and Pennsylvania, and sketch some of the key factors that contributed to divergent movement trajectories in these states. This discussion offers the reader an overview of the central themes, which guide an in-depth qualitative analysis of movement dynamics presented in the following sections.

During the late 2000s, the rapid expansion of unconventional oil and gas development (UOGD) in the Marcellus Shale led to public concerns over locally unwanted land uses (LULUs), as well as, broader environmental conflicts over the potential risks of drilling. Public attention focused on high-volume hydraulic fracturing (or fracking), a process that uses massive amounts of water and a mixture of chemicals and other materials to stimulate well production. This process, in particular, raised environmental issues related to the contamination and overconsumption of water supplies. Although fracking technically refers to a specific aspect of the drilling process,

the term came to be synonymous with UOGD, and opposition to drilling was commonly referred to as the “anti-fracking movement.”<sup>7</sup>

In New York and Pennsylvania, the anti-fracking movement was comprised of a diverse range of collective actors. Grassroots activists formed local environmental advocacy organizations (EAOs) that focused specifically on fracking, and many pre-existing local EAOs shifted their focus to drilling issues. At the same time, state and national EAOs, such as the Natural Resources Defense Council (NRDC) and the Atlantic and Pennsylvania Chapters of the Sierra Club, lobbied political decision-makers for stronger environmental regulations. In New York, a synergy developed between grassroots mobilization and professional advocacy that made the anti-fracking movement highly relevant in state politics. Efforts to expand and integrate grassroots mobilization into a statewide anti-fracking movement were much less successful in Pennsylvania.

In each state, movement emergence, and the interplay of grassroots and professional mobilization was shaped differently by timing, history, and contingency. Interest in the New York Marcellus Shale emerged after news of the environmental risks of UOGD had begun to surface, and targeted a region with particular significance to New York’s urban elites. This situation supported preemptive mobilization by environmental activists who were well-resourced and politically connected. In 2008, Governor David Paterson’s decision to order a moratorium and environmental review of HVHF allowed New York’s anti-fracking movement to coalesce around a clear goal and institutional venue. Activists targeted the generic environmental impact statement (GEIS), and its

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<sup>7</sup> While not all environmental activists sought to ban fracking, I follow common usage and refer to the political movement that formed to address the risks of shale drilling as the anti-fracking movement.

preparation by the New York State Department of Environmental Conservation (NYSDEC), and generally sought a fracking ban. By contrast, in Pennsylvania, the political controversy over UOGD and fracking emerged after the industry was already well-entrenched in the state. This combined with the state's historical dependence on natural resource extraction created significant barriers to more extensive environmental mobilization. UOGD raised a host of policy issues at both the local and state-level, none of which managed to unite Pennsylvania's disperse community of activists. This made building a state-wide movement a challenging task. Furthermore, political decision-makers in Pennsylvania generally supported the shale gas boom. As a result, activists in this state had fewer political allies and faced pressure to conform to standards of discourse that favored the gas industry. The following analyses further describe the distinct movement dynamics observed in New York and Pennsylvania against the backdrop of each state's extractive history.

## ENVIRONMENTAL HISTORY AS A PRE-CONDITION FOR MOVEMENT DIVERGENCE

The Marcellus Shale gas boom grew out of a more general expansion of natural gas development that began in New York and Pennsylvania during the early 2000s. This section discusses this earlier drilling boom and uses it to describe differences in natural gas production between these states. Although natural gas development occurred in New York prior to the shale gas boom, I show that the industry was much smaller and more

geographically isolated than in Pennsylvania. I briefly discuss how this influenced the timing of Marcellus Shale gas well development in each state, which had consequences for movement emergence in each state. Pennsylvania not only had higher levels of natural gas development, it was also, unlike New York, a major producer of coal. I illustrate that fossil fuel extraction occurred throughout the state of Pennsylvania, and discuss how the state's legacy of coal mining created barriers to anti-fracking mobilization. I briefly compare this to the mobilization context in New York, which was shaped by a pattern of environmental preservation more conducive to the emergence of a popular anti-fracking movement.

Although both states experienced an increase in gas well activity during this period, the timing and intensity of drilling reflected enduring differences in the states' extraction potential. Pennsylvania possesses abundant fossil fuel resources, particularly in the western part of the state. Thus, drilling initially targeted more promising natural gas reservoirs in this area. As companies shifted their attention to the Marcellus Shale, gas leasing and drilling began to intensify in Northeastern Pennsylvania, and New York's Southern Tier. This brought natural gas development to areas that had relatively little experience with fossil fuel extraction at the same time as awareness of the negative impacts of drilling began to increase. The shale gas boom also raised the possibility of intensive drilling within the Delaware River watershed, a region of significant interest to urban elites and major environmental organizations. These factors came together to spark environmental mobilization in the Catskills region that significantly contributed to movement emergence in New York and Pennsylvania. Distinct histories of resource

extraction and urban influence fundamentally shaped the context of mobilization and led to the emergence of two very different anti-fracking movements these states.

In 2000, a tight supply situation, escalating natural gas prices, and looming natural gas shortages spurred exploration in new and unproven natural gas fields (U.S. Energy Information Administration 2001). At the same time, technological innovations supported experimentation with deep and horizontal well drilling. Together these factors created new possibilities within technically challenging conventional and unconventional reservoirs. As early as 1998, the Trenton Black-River formation, a conventional but economically risky natural gas reservoir, was highlighted by the New York State Department of Environmental Conservation (NYSDEC) for attracting large and highly capitalized oil and gas companies to the state (1998: ii). This trend accelerated when advancements in high-volume hydraulic fracturing (HVHF) and horizontal drilling led companies to drill in the Marcellus Shale. Range Resources completed the first successful Marcellus Shale well in Pennsylvania in 2004, and by 2008, the Marcellus Shale gas boom was underway. In a few short years, the natural gas industry in New York and Pennsylvania went from a modest business involving small-scale conventional operators to a “high-tech, high-risk enterprise” dominated by major corporations (New York State Energy Research and Development Authority 2007: 23).

Between 2000 and 2009, New York and Pennsylvania both experienced an increase in gas well activity. However, drilling was much more intensive in Pennsylvania. Table 3.2 illustrates that historical differences in drilling persisted during the 2000s gas boom. From the 1990s to the 2000s, wells drilled in New York more than doubled from 1,182 wells to 2,569 wells. However, in both decades, there were

significantly more wells drilled in Pennsylvania. From the 1990s to the 2000s, wells drilled in Pennsylvania grew from 11,897 wells to 33,530 wells. During the 2000s, 1,317 unconventional wells were drilled in Pennsylvania. No unconventional wells were drilled in New York due to a fracking moratorium instituted in 2008. However, in 2008 and 2009, the New York State Department of Environmental Conservation (NYSDEC) received 60 applications for HVHF wells. This indicates that, despite the moratorium, most observers assumed that New York State would eventually permit shale drilling (Wilber 2012).

Table 3.2 Natural Gas Development, 1990 to 2016

	New York			Pennsylvania		
	1990s	2000s	2010-2016	1990s	2000s	2010-2016
Conventional	1,182	2,569	978	11,897	32,213	6,086
Unconventional	n/a	0	0	n/a	1,317	8,774
HVHF Applications	n/a	(60)	(32)	n/a	missing	Missing
Total wells drilled	1,182	2,569		11,897	33,530	14,860
Natural gas production (billion cubic feet)	0.2	0.43	0.16	1.35	1.8	21.78

Widespread opposition to fracking eventually led New York State to ban fracking in 2015. Yet, even before this, the fracking controversy had more or less put an end to New York's natural gas boom. In Pennsylvania, a relatively weak anti-fracking movement did little to hamper the rapid expansion of UOGD. During the 2010s, the number of unconventional wells (8,774) drilled in Pennsylvania surpassed the number of conventional wells (6,086). UOGD in Pennsylvania was exceptionally productive.

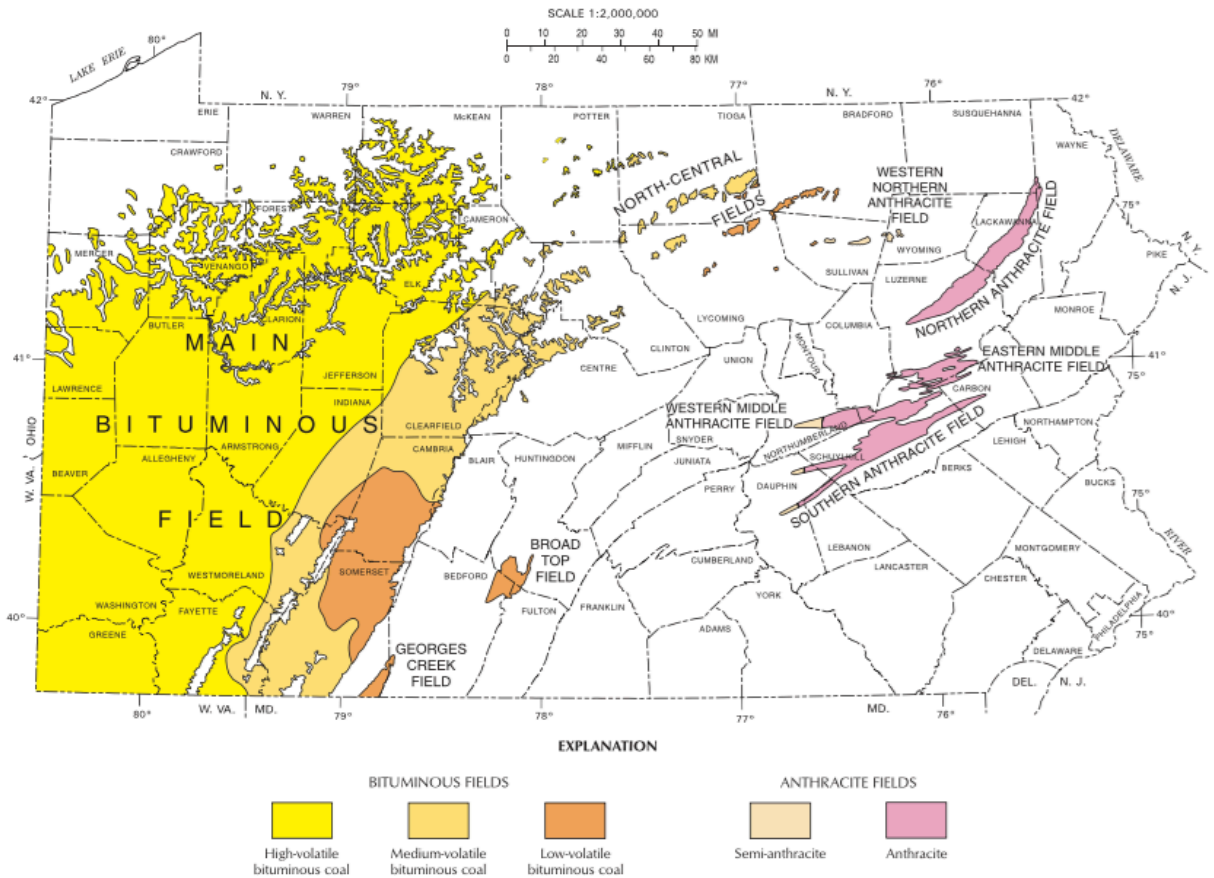
Whereas the state only produced 1.8 billion cubic feet (bcf) of natural gas during the 2000s, this figure rose to 21.78 bcf between 2010 and 2016, directly as a result of production from the Marcellus Shale. In 2010, Pennsylvania ranked eight among U.S. states in natural gas production, but by 2016, it ranked second, just below Texas. With the shale gas boom, Pennsylvania again became a major producer of natural gas, a position it hadn't held since the early 20<sup>th</sup> century. While these events were somewhat unexpected, they are consistent with a broader pattern of energy development in Pennsylvania. Further examination of Pennsylvania's resource endowment helps to place the Marcellus shale gas boom in context, and reveals fundamental differences between New York and Pennsylvania, which were consequential for the development of these states' anti-fracking movements.

First and foremost, Pennsylvania is a major coal producing state. Two forms of coal are mined in Pennsylvania: anthracite and bituminous. Anthracite, or hard coal, is a high quality fuel that burns hotter, longer, and cleaner than bituminous coal. Pennsylvania contains the only reserves of anthracite coal in the United States, which are found in three concentrated fields in the eastern part of the state (see Figure 3.2). From the 1820s to the 1950s, anthracite was heavily mined in Pennsylvania, and contributed significantly to the industrialization of the United States. Anthracite production peaked during World War I, and by the 1950s, the coal economy had more or less collapsed in Northeastern Pennsylvania. Nevertheless, coal left a lasting legacy on the culture, environment, and economy of the region (MacGaffey 2013). Pennsylvania's bituminous coal reserves are much more expansive. As shown in Figure 3.2, they cover most of the Western part of the state. Bituminous coal production also peaked in Pennsylvania during



the first half of the twentieth century. Yet, the state continues to produce significant quantities of coal. In 2016, Pennsylvania produced 44.8 million tons of bituminous coal, and 7.6 million tons of anthracite coal, making it the third largest coal producer in the United States (Pennsylvania Department of Environmental Protection 2016a; U.S. Energy Information Administration 2017b).

Figure 3.2 Distribution of Pennsylvania's Coal Fields



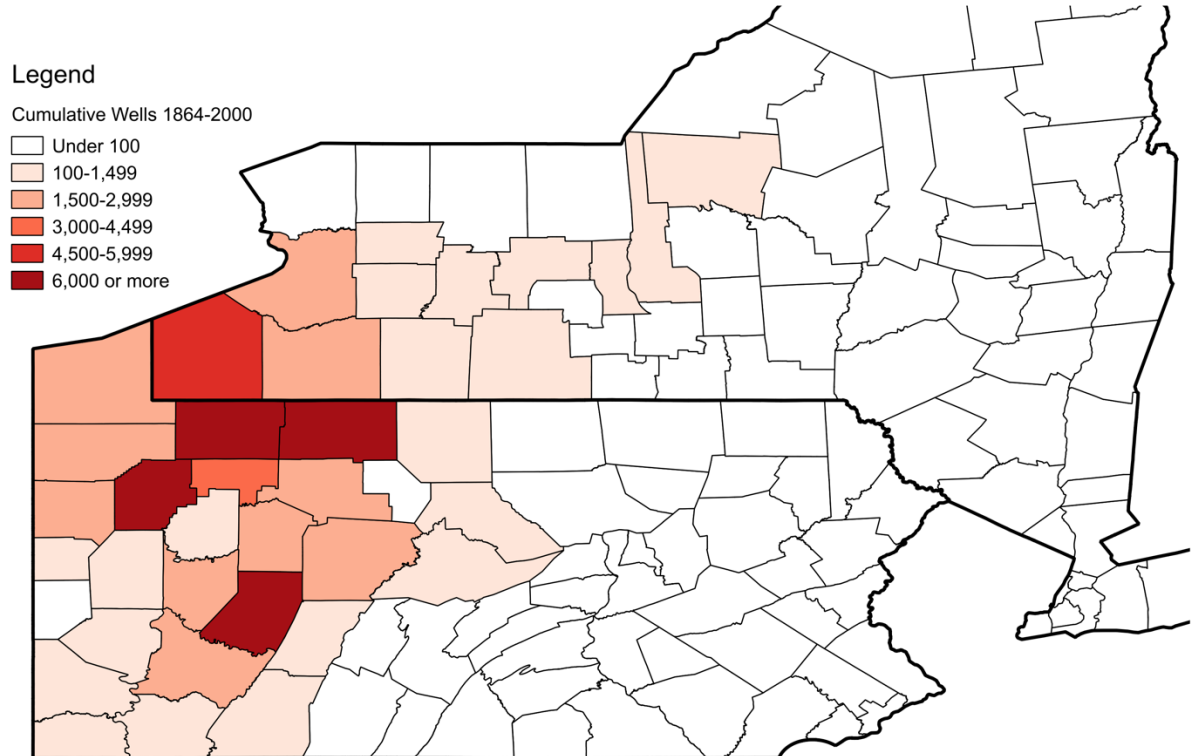
Source: Edmunds 2002

The importance of the coal industry in Pennsylvania clearly differentiates this state from New York. New York does not possess coal reserves, and other forms of mining are minimal within the state. The broader consequences of Pennsylvania's coal legacy, and its relevance for anti-fracking mobilization will be discussed in the following paragraphs. However, first, I consider the geographic distribution of natural gas development within New York and Pennsylvania as this factor is also significant for understanding distinct patterns of movement emergence in these states.

Figure 3.3 displays cumulative oil and gas wells in New York and Pennsylvania by county from 1864 to 2000. Historically, natural gas development has been confined to the western regions of these states. However, Figure 3.3 illustrates that not only has New York experienced much less drilling than Pennsylvania, but that oil and gas activity has also been more geographically confined in the former state. In New York, most oil and gas activity occurred in a three-county cluster on the western edge of the state. Chautauqua, Cattaraugus, and Erie were the only New York counties with cumulative wells above 1,500, and only one county (Chautauqua County) had cumulative wells above 4,500. By contrast, 13 counties in Pennsylvania had cumulative wells above 1,500, and four counties (Warren, McKean, Venango, and Indiana) had 6,000 or more cumulative wells. Even before the Marcellus Shale gas boom, natural gas development occurred within a much larger region of Pennsylvania than New York. Furthermore, Pennsylvania's oil and gas wells were primarily located within the state's bituminous coal region (see Figure 3.2). This is important because it shows that fossil fuel extraction was deeply engrained in Western Pennsylvania prior to the 2000s natural gas boom. I

argue that this helps explain why an anti-fracking movement was slow to emerge in this region, even though it was the first area to be impacted by the rapid expansion of drilling.

Figure 3.3 Cumulative Oil and Gas Wells in New York and Pennsylvania, 1864-2000



Source: Pennsylvania Department of Environmental Protection and the New York Department of Environmental Conservation

Between coal mining and natural gas development, most counties in Pennsylvania have been touched by fossil fuel extraction. In particular, Pennsylvania's coal field regions have been strongly influenced by extractive industries. Coal mining is an intensive process that has significant and lasting environmental impacts. Throughout Pennsylvania's coal regions, one finds coal refuse piles, barren patches of reclaimed land,

and other stained streams that have been polluted by acid mine drainage. The interruption of otherwise scenic landscapes, loss of wildlife habitat, and pollution of watersheds is not only unfortunate, but expensive. There is a real economic cost to the environmental legacy of coal, one that has been paid by coal communities and American taxpayers. In particular, the state and the federal government have spent billions to reclaim abandoned mine land (AML) in Pennsylvania, and the state's remaining AML legacy cost is estimated to be \$5 and \$15 billion (McIlmoil et al. 2012). Furthermore, mine subsidence and pollution present barriers to the development of new industries in coal communities, many of which continue to struggle economically from cycles of coal boom and bust (Black, McKinnish, and Sanders 2005).

While there are many negative aspects to Pennsylvania's coal legacy, these have not necessarily led residents to develop an unfavorable view of extractive industries. In the heart of coal country, many still consider resource extraction to be an important industry, one that represents not only a paycheck but a way of life (Dublin and Licht 2005; MacGaffey 2013). Even in areas where the collective memory of coal has faded, resource development may still present a welcome economic opportunity. This is especially true in rural and politically conservative areas where most resource extraction occurs. Moreover, such communities may also be resistant to the values of modern environmentalism, which presents yet another barrier to oppositional mobilization (Guillon 2015; Jerolmack and Walker 2018).

New York escaped the ravages of coal mining, which in turn provided opportunities for environmental preservation. Chapter Two described how a unique constellation of elite interests based in New York City supported the establishment of the

Adirondack and Catskill Forest Preserves as “forever wild”, and led to a unique water supply management system that strengthened elite interests in preserving the environmental quality of rural communities within the New York City watershed. This research will show how New York’s path of environmental preservation led to local anti-fracking movements, supported coordination among grassroots and professional activists, and provided the movement with influential political allies. New York’s anti-fracking movement was further supported by contingent events, in particular the preemptive moratorium on fracking, which helped unify activists around the goal of a statewide fracking ban.

A different dynamic unfolded in Pennsylvania where a history of fossil fuel extraction created less favorable conditions for movement expansion. Gas development was well-entrenched within Pennsylvania by the time that environmental opposition to fracking emerged. The political influence of the gas industry provided the Pennsylvania anti-fracking movement with fewer political opportunities and led many activists to adopt moderate policy positions. Lack of consensus in support of a fracking ban created a major coordination problem for movement organizers who failed to develop an agenda capable of unifying a diverse set of actors and interests. As a result, anti-fracking mobilization in Pennsylvania primarily involved limited and local campaigns that failed to gain much traction statewide. Thus, while history created a challenging context for activists, movement expansion was also inhibited by the strategies and tactics of collective actors.

## DIVERGENT MOVEMENT TRAJECTORIES IN NEW YORK AND PENNSYLVANIA

This section describes early responses to the natural gas boom and traces how divergent anti-fracking movement trajectories unfolded in New York and Pennsylvania. I provide a historical analysis that situates community responses to gas drilling and movement organizing within the distinct mobilization context of each state. Historical differences in natural resource extraction provide a general backdrop for understanding state differences in the timing of movement emergence, and the motivations, opportunities and strategies of collective actors.

During the 2000s, natural gas development expanded rapidly in Pennsylvania, and to a lesser extent in New York. In both states, the gas boom initially targeted western counties where drilling had occurred in the past. At first, gas drilling did not capture much attention. To the extent that local stakeholders took notice of the industry, they tended to greet its growth favorably. However, natural gas development became more controversial as gas leasing and drilling encroached upon residential areas, and expanded into areas unfamiliar with natural resource extraction. Emergent opposition to drilling occurred in Southwestern Pennsylvania as early as 2001, but remained sporadic and disorganized, and failed to move beyond NIMBY grievances. It was not until 2008, after the Marcellus Shale gas boom led to drilling in Northeastern Pennsylvania and New York's Southern Tier, that an environmental movement emerged, which focused on the technological risks of fracking. The anti-fracking movement began in the New York Catskills in the Spring of 2008, and spread quickly to New York City and throughout

Upstate New York. By 2009, anti-fracking movements were developing in Pittsburgh, Philadelphia, and Central Pennsylvania.

### *LULUs and NIMBYs*

The conventional drilling boom of the early 2000s sparked emergent opposition to drilling in Southwestern Pennsylvania. However, this opposition focused on locally unwanted land uses (LULUs) rather than broader environmental concerns. Given this region's legacy of fossil fuel extraction, local residents and regional EAOs did not see the drilling boom as a new and significant risk, but rather as a continuation of longstanding land use conflicts. As a result, EAOs failed to engage significantly in the issue, and emergent opposition remained limited by NIMBY (not in my backyard) grievances.

Gas well development is an industrial process that significantly alters the surrounding landscape. The negative impacts of drilling are exaggerated with UOGD, which requires well pads that are four to six times larger than conventional single-acre pads. Larger well pads accommodate a greater number of holding tanks, waste pits, equipment, and trucks necessary to drill and stimulate a horizontal well. Those living near gas well operations commonly complain of truck traffic, noise, degraded infrastructure, air pollution, and a general loss of community well-being. Drilling can also lead to water contamination, a risk amplified by high-volume hydraulic fracturing (HVHF). HVHF utilizes large amounts of water and chemicals, which are injected into the wellbore. Much of this fluid returns to the surface as flowback, magnifying issues of wastewater storage and disposal. In late 2000s, public perceptions of UOGD became

tightly linked with HVHF (i.e., fracking), and the risks of toxic chemical exposure and groundwater pollution. The social construction of UOGD as a technological risk contributed significantly to development of the anti-fracking movement. Prior to this, emergent opposition was largely driven by NIMBY grievances that focused on LULUs within residential areas.

Between 2001 and 2007, newspaper reports covered local opposition to drilling in fifteen communities in Pennsylvania. All but one were located in Western Pennsylvania in either Allegheny, Fayette, Indiana, or Westmoreland County. Local opposition in the township of Nockamixon in Bucks County was the only case to occur in Eastern Pennsylvania before 2008, and one of only three where an EAO engaged in some form of action. Table 3.3 lists the municipalities where emergent opposition was observed, and was compiled from newspaper reports in the Newsbank database.

Table 3.3 Emergent Drilling Opposition in Pennsylvania  
Municipalities, 2001-2007

City	County	First Observation
Monroeville	Allegheny	2001
Murrysville	Westmoreland	2001
Washington	Westmoreland	2001
Penn Hills	Allegheny	2002
Oakmont	Allegheny	2003
Mount Pleasant	Westmoreland	2003
Perry	Fayette	2004
Dunbar	Fayette	2005
Black Lick	Indiana	2005
Greensburg	Westmoreland	2005
Salem	Westmoreland	2005
West Deer	Allegheny	2006
Nockamixon	Bucks	2006
Masontown	Fayette	2007
Latrobe	Westmoreland	2007



A review of newspaper reports suggests that, for all cases, local opposition was primarily driven by NIMBY grievances. LULU opposition was also mostly located in suburban and residential areas. For example, in May, 2001, LULU opposition emerged over the proposed siting of a gas well in a municipal park in Monroeville, Pennsylvania, a suburban town located 10 miles from Pittsburgh (Zapf 2001). In September 2001, residents of nearby Murrysville provided testimony at a municipal hearing, which highlighted safety concerns and excessive noise. There is evidence that in some areas LULU opposition prompted collective action. In Oakmont and Mount Pleasant, Pennsylvania, residents circulated petitions to oppose gas wells in their communities, and presented them to municipal officials (Basinger 2004; Narkevic 2006). Nevertheless, early opposition to drilling failed to develop an organizational base or move beyond NIMBY grievances.

Newspaper reports of LULU opposition spotlighted local residents who expressed concerns over the safety of drilling within residential areas, the loss of quality of life, and lowered property values. However, I found few mentions of environmental risks, and little sign that initial opposition to gas well sitings developed into local movements against drilling. A few municipalities that experienced LULU opposition sought to use local ordinances to protect landowners and restrict drilling within residential areas. Two municipalities, Oakmont and Salem, became embroiled in legal challenges brought by the gas industry that eventually went to the Pennsylvania Supreme Court (Yerace 2005; Usher 2007). There is some evidence that a group of Oakmont residents organized around this legal challenge and sought help from environmental groups (Tribune-Review 2007). However, local mobilization in Oakmont remained limited to the narrow issue of

municipal zoning rights. I could not find any evidence of local anti-fracking EAO founding or environmental protest in Oakmont or Salem. In Nockamixon and Latrobe, EAOs participated in informational forums on gas drilling. Nevertheless, statements by local residents indicated that drilling opposition continued to be framed in terms of local impacts, and not broader environmental or technological risks.

Emergent opposition to drilling in Pennsylvania did not develop into an environmental movement until after the political controversy over fracking emerged in New York. In Southwestern Pennsylvania, intense drilling during the early 2000s provided an initial warning of the potential negative impacts of the gas boom. However, the issue did not become a major concern of environmental activists until after New York imposed a moratorium on fracking in 2008. The Marcellus Shale gas boom led to gas leasing and drilling in Northeastern Pennsylvania and New York's Southern Tier, areas that were unfamiliar with fossil fuel extraction. Mobilization by local activists and professional EAOs in this region brought attention to the environmental and public health risks of UOGD and fracking, and led to the emergence of New York and Pennsylvania's anti-fracking movements.

### *From Dollar Signs to Protest Signs*

Although pockets of resistance emerged during the early 2000s, many local stakeholders viewed the gas boom favorably. Initial efforts to raise awareness about drilling within the Marcellus Shale were actually sponsored by public officials and other

pro-drilling interests who sought to educate landowners about gas leases and help them take advantage of upcoming economic opportunities. In December 2007, Range Resources went public with production figures from the first successful Marcellus Shale wells, and in January 2008, Penn State University published a press release, which predicted that the Marcellus Shale could significantly boost the U.S. supply of natural gas (Silver 2011; Messer and Fong 2009). Subsequent media buzz, along with gas leasing and drilling in Northeastern Pennsylvania and New York's Southern Tier, significantly increased public attention to the shale gas boom. In particular, these events caught the attention of environmental activists along the Pennsylvania-New York border who quickly mobilized to prevent drilling within the Delaware River watershed. Activists efforts to raise awareness about the environmental impacts of UOGD and fracking provided an alternative image of the Marcellus Shale gas boom, one that emphasized technological risks and public health threats. I describe how environmental mobilization led to the emergence of anti-fracking movements, first in New York, and then in Pennsylvania.

Prior to the political controversy over fracking, those who took an interest in the natural gas boom primarily held a positive view of the industry. In New York and Pennsylvania, landowner coalitions formed to collectively negotiate with gas companies and obtain a higher price for their mineral rights (Wilber 2012). Cooperative extension offices and government officials also sponsored public meetings and gas leasing seminars to educate landowners about gas drilling and gas lease agreements. In 2007 and 2008, excitement grew as gas leasing expanded rapidly throughout Pennsylvania and New York's Southern Tier. The application of drilling and completion technologies developed

in the Barnett Shale in Texas to the Pennsylvania Marcellus Shale sparked a massive land grab. Gas rights, which historically sold for \$2 to \$25 an acre, increased dramatically, and in some cases, brought over \$2,000 an acre (Wilber 2012). Such figures and increased gas well activity captured the attention of a wider audience.

By the spring of 2008, gas-leasing seminars drew significant crowds throughout Pennsylvania, and along the southern border of New York. On April 16<sup>th</sup> 2008, over one thousand landowners from across Northeastern Pennsylvania packed the Tunkhannock Area High School for an event organized by Penn State Cooperative Extension, and the Wyoming County Conservation District (Rudolf 2008). In many ways, this event was similar to previous workshops. Speakers provided the usual legal and technical information, and advice on oil and gas leases. However, there were some telling additions that accounted for the full house that evening. Attendees received a primer on unconventional gas drilling, and an introduction to the shale gas boom as representatives from nine gas companies greeted participants entering the auditorium (Rudolf 2008). In New York's Southern Tier, similar events sponsored by Cornell Cooperative Extension and the New York Farm Bureau were also packed. At these meetings, speakers warned landowners to carefully consider the details of lease agreements, but generally downplayed the negative impacts of drilling. Industry experts described horizontal drilling and hydraulic fracturing as proven technologies that carried relatively few environmental risks. The dominant view was that the Marcellus Shale gas boom presented a major economic opportunity with few downsides.

This view was challenged early in 2008 by grassroots activists and professional EAOs based within the Delaware River watershed who began to sponsor their own gas

drilling forums. Unlike cooperative extension events, these meetings focused on the negative impacts of drilling. An event held in Callicoon, New York on May 5, 2008 provides an example of early efforts to educate local residents about the risks of UOGD and fracking. Over four hundred people attended the event, which featured filmed testimony by residents of Washington County, Pennsylvania, and presentations by environmental activists on the negative impacts of unconventional drilling (Thomas 2008). Washington County, Pennsylvania was one of the earliest areas affected by the shale gas boom. 471 gas wells were drilled there between 2005 and the spring of 2008.<sup>8</sup> Presentations by Washington County residents highlighted unsafe drilling practices and declining property values. Presenters also warned of the environmental risks of fracking, and naturally occurring radioactive materials (NORMs) found in drilling waste. Over the next few years, anti-fracking workshops and protest events would become increasingly common as local activists and professional EAOs sought to educate the public and political decision-makers about the environmental and public health threats posed by shale gas drilling.

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<sup>8</sup> Only 80 of these wells were unconventional wells. As in other areas, the initial drilling boom included both conventional and unconventional wells. In Washington County, Pennsylvania, conventional drilling initially grew more rapidly, from 17 wells in 2004 to 199 wells in 2008. In 2009, this was surpassed by unconventional drilling as new technologies of high-volume hydraulic fracturing were proven.

*Preemptive Mobilization in New York*

The meeting in Callicoon, New York was organized by Damascus Citizens for Sustainability (DCS), a group that began just across the border in Pennsylvania.<sup>9</sup> DCS was organized in February 2008 by Barbara Arrindell, a suburban New Yorker who had for sometime lived near Milanville, PA, a small town located on the Delaware River near the New York border (McGraw 2011). Arrindell extensively researched the negative impacts of UOGD and fracking in other U.S. shale fields, and helped organize a public information campaign that brought attention to the potential risks of fracking within New York City's watershed. While DCS was based in Pennsylvania, it became an important figure in the development of New York's anti-fracking movement. The members of DCS included New York City residents with summer homes in the Catskills who lobbied their city council members and state representatives for a moratorium on fracking (Levine and Cyphers 2008). DCS also provided the filmmaker, Josh Fox, with initial funding and background information for the documentary *Gasland*, a film that would play an important role in the expansion of the anti-fracking movement (DCS 2012). DCS was a significant contributor to anti-fracking mobilization in New York, but it was not the only environmental group to raise concerns over the impacts of shale drilling. Further consideration of the organizational basis of movement emergence in New York reveals a unique set of circumstances that highly favored anti-fracking mobilization in this state.

In 2008, a loose coalition of grassroots and professional EAOs came together in New York to organize a preemptive campaign against fracking. This coalition included

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<sup>9</sup> This is the first local anti-fracking EAO to form in either New York or Pennsylvania.

recently founded local anti-fracking EAOs such as DCS and Catskills Citizens for Safe Energy, as well as, professional EAOs, such as Catskill Mountainkeeper, Hudson Riverkeeper, the Wilderness Society, the Sierra Club-Atlantic Chapter, and the Natural Resources Defense Council (NRDC).<sup>10</sup> Gas leasing within New York's Catskill region not only caused concern among local activists. It caught the attention of major environmental organizations who had significant interests in the region related to the protection of New York City's water supply system. Connections among regional EAOs based in the Catskill region, and major EAOs based in New York city facilitated preemptive mobilization that combined lobbying activity with local organizing. While professional EAOs directly lobbied political decision-makers for a moratorium and environmental study of fracking, local movement organizers began to raise awareness about the environmental risks of shale gas drilling. The synergy between professional and grassroots mobilization supported the emergence of the New York anti-fracking movement.

Pre-existing cooperative relationships between major EAOs based in New York City, and Catskill Mountainkeeper, a professional EAO based in Sullivan County, New York, significantly contributed to preemptive mobilization and coalition-building. Catskill Mountainkeeper formed in 2006 to advocate for the Catskill region, and was one of the first EAOs to bring attention to the risks of shale gas drilling in New York. Catskill Mountainkeeper had multiple ties to the NRDC. Not only did it work with NRDC staff on issues related to the construction of casinos in the Catskill region, but it was also co-

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<sup>10</sup> Personal interview with representative of Catskill Mountainkeeper on November 18, 2013 in Callicoon, NY.

founded by Ramsey Adams, the son of NRDC founder John Adams.<sup>11</sup> Catskill Mountainkeeper began working on the fracking issue in 2007, and in 2008, worked with the Sierra Club-Atlantic Chapter and the NRDC to raise awareness about proposed legislation that sought to facilitate drilling with the New York Marcellus Shale. Although a last ditch effort to oppose this legislation failed, pressure from these organizations helped convince Governor David Paterson to impose a moratorium and environmental review of fracking in July 2008. This decision created a significant opportunity for activists who used the environmental review process as a tool to educate the public and mobilize opposition to fracking, not just in the Catskill region, but throughout Upstate New York.<sup>12</sup>

New York's environmental review of fracking involved the completion of a supplemental generic environmental impact statement (SGEIS) by the New York State Department of Environmental Conservation (NYSDEC). As part of the SGEIS process, the NYSDEC instituted a public comment period and held public hearings throughout the state. Movement organizers used this opportunity to mobilize citizens to attend public hearings and submit written comments. For example, in December 2008, Catskill Mountainkeeper and Catskill Citizens for Safe Energy held a workshop in Narrowsburg, New York to teach citizens how to participate in the SGEIS process and provide information about the issues being reviewed as part of the study (The Wayne Independent 2008). The SGEIS process provided an a pathway to activism for many New York

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<sup>11</sup> Personal interview with a representative of the Natural Resources Defense Council on December 12, 2013, New York, NY.

<sup>12</sup> Personal interview with representative of Catskill Mountainkeeper on November 18, 2013 in Callicoon, NY.



residents. This was highlighted by an organizer from Catskill Mountainkeeper whom I interviewed on November 18, 2013.

“It created an incredible education platform. I remember going to one of the early comment periods for the SGEIS, and there were people up there with their paper shaking and not really knowing how to do the whole hearing. There is an army of people in New York now that get up there and sound, they are experts on fracking. They have all the documentation. They can cite where the information is coming from, and they sound like a hired lawyer or scientist. And it’s just Joe from Onondaga or wherever.”

The SGEIS process supported the development of the New York anti-fracking movement by providing a tool to educate the public about the risks of fracking and offering citizen activists an accessible opportunity to protest. It also provided movement organizers with a clear focus and helped unite a diverse set of social movement actors around a common strategy and goal. Early on, movement organizers concentrated on extending the SGEIS and expanding the scope of the review to include the public health impacts of fracking. These efforts successfully delayed a decision on fracking, which provided the movement time to develop an organizational infrastructure and build consensus in support for a statewide fracking ban. The NYSDEC released a draft SGEIS for public comment on September 30, 2009. Over 13,000 comments were received on the draft SGEIS, which were highly critical of NYSDEC’s findings and recommendations. In December 2010, after massive public outcry, Governor Paterson directed the NYSDEC to

publish a revised draft of the SGEIS and to accept public comment on the revisions. The NYSDEC released the revised SGEIS for public comment in September 2011, and published draft regulations in October 2011. In the interceding years, public information campaigns supported in part by the popular documentary *Gasland* contributed to the founding of local anti-fracking EAOs throughout the state. As the public became more educated about the risks of fracking, popular support for a statewide ban grew.

A combination of factors contributed to the emergence of the New York anti-fracking movement. The Marcellus Shale gas boom raised the possibility of drilling within an area of the state that was unfamiliar with resource extraction, and which was of significant cultural and economic importance to liberal elites. As a result, local opposition to drilling could draw upon the substantial resources and political influence of professional EAOs based within New York City. The existence of a regional EAO capable of mediating between professional and grassroots environmental interests helped the movement overcome potential conflicts and coordination problems. Movement organizers also effectively cultivated opportunities associated with the SGEIS to expand their constituency, develop the capacity activists, and build coalitions and organizational infrastructures capable of supporting mass mobilization. Later in this chapter, I examine the structure and trajectory of anti-fracking mobilization in New York in greater detail. However, first, I consider a very different pattern of movement emergence in Pennsylvania.

### *Delay and Disconnection in Pennsylvania*

In Pennsylvania, opposition to shale gas drilling developed much more slowly, was more dispersed, and struggled to link up and form a statewide anti-fracking movement. Prior to 2009, there was very little environmental mobilization around drilling issues in Pennsylvania, and that which did occur tended to be organized by moderate groups that were tangential to the environmental movement. Although local anti-fracking movements emerged in Pittsburgh, Philadelphia, and Central Pennsylvania in 2009, these movements were not well integrated and only loosely connected to professional EAOs. Regional anti-fracking campaigns in Pittsburgh and Philadelphia strengthened ties between grassroots and professional EAOs. However, movement organizers in Pennsylvania experienced significant problems building a statewide coalition and struggled to develop a broad-based campaign capable of supporting movement expansion and ongoing participation. To some extent, poor strategy and limited resources hampered the Pennsylvania anti-fracking movement. However, movement organizers also encountered a very challenging set of circumstances. Activists were up against a well-entrenched and politically powerful industry, and had little hope of achieving a moratorium or fracking ban. I consider how this confluence of factors affected the development of the Pennsylvania anti-fracking movement.

Prior to anti-fracking mobilization in New York, there were few efforts to raise awareness about the environmental risks of gas drilling in Pennsylvania. The Mountain Watershed Association (MWA) was one environmental organization that took a proactive role in the Southwestern part of the state. MWA is a professional EAO that was founded in 1994 to protect, conserve and restore the Indian Creek watershed in Fayette and

Westmoreland Counties, Pennsylvania. In 2003, MWA became the Youghiogheny Riverkeeper and expanded its work to the larger Youghiogheny River basin. In March 2007, MWA organized an informational meeting on coal bed methane wells, another form of unconventional drilling that occurred in this region during the early 2000s (Panian 2007). The meeting was co-sponsored by the Tri-State Citizens Mining Network and Conemaugh Valley Conservancy, and was attended by about 80 property owners and two state legislators. Based on newspaper coverage, environmental concerns were overshadowed by the grievances of property owners who were forced to relinquish their lands for drilling because they did own the mineral rights. In February 2008, MWA also objected to a deal between Atlas Energy, Inc. and the Connellsville Municipal Authority, which would have led the city to discharge treated wastewater from gas wells into the Youghiogheny River (Kroeger 2008).

By the fall of 2008, news of the Marcellus Shale gas boom helped inspire other events to raise awareness about the risks of gas drilling in Pennsylvania. However, these efforts typically involved organizations that were tangential to the environmental movement and not strongly opposed to drilling. In Bradford County, Penn-York Bentley Creek Watershed Association and the Towanda Chapter of the American Association of University Women held events to discuss gas drilling issues in September 2008 (Loewenstein 2008a,b). The League of Women Voters of Washington County also held a gas drilling forum in October 2008 (Observer-Reporter 2008). While these events addressed the negative environmental impacts of drilling, they featured presentations from government officials and gas company representatives rather than speakers from the environmental community. In Northeastern Pennsylvania, there was some evidence of

environmental mobilization. In Susquehanna County in October 2008, a local Citizens Action group hosted a screening of the film *A Land Out of Time*, which documented the negative impacts of the drilling boom in Colorado (Susquehanna County Independent and Weekender 2008). However, oppositional mobilization did not gain much traction in Pennsylvania until 2009 after the political controversy over fracking emerged in New York.

By 2009, local anti-fracking movements began to take shape in Pittsburgh, Philadelphia, and Central Pennsylvania. Anti-fracking mobilization was greatest in the Pittsburgh area where shale gas drilling threatened highly populated urban and suburban communities. However, efforts to organize anti-fracking movements in other parts of Pennsylvania also had modest success. The political controversy over fracking led to the formation of local anti-fracking EAOs in a number of communities. Mobilization by such groups significantly increased public awareness of the risks of shale gas drilling. Some of these organizations developed collaborative relationships with professional EAOs to sponsor protest events and mobilize public comments on proposed oil and gas regulations. Nevertheless, anti-fracking mobilization remained rather limited in Pennsylvania and failed to form a cohesive movement statewide.

According to Staggenborg (2018), the Pittsburgh anti-fracking movement emerged late in 2009 and 2010. Opposition to fracking began to surface in and around Pittsburgh as residents learned about the leasing of land for the Marcellus Shale gas boom. In particular, a special screening of *Gasland* in Pittsburgh on June 5, 2010, which was attended by Josh Fox, helped raise awareness about the risks of fracking. This increased public attention to the potential for drilling in residential areas and increased

the momentum of community organizing that began in late 2009. A loose coalition of concerned citizens, veteran activists, and grassroots and professional EAOs came together to organize a large protest held on November 3, 2010, and campaign for a local fracking ban, which was adopted by the Pittsburgh city council on November 16, 2010. The Pittsburgh anti-fracking movement had some success expanding mobilization beyond the city to suburban and rural areas. However, it failed to develop a strong organizational infrastructure and struggled to maintain mobilization intensity overtime.

The story of the Pittsburgh anti-fracking movement is, in many ways, indicative of a pattern that shaped anti-fracking mobilization statewide. While the initial protest and municipal ban campaign helped spark local fractivism, the movement failed to coalesce around a clear target and goal. The main organization to form out of this campaign, Marcellus Protest (MP), served more as a network of activists and an information hub than a formal EAO. Individual activists and antifracking groups played an important role mobilizing protest and awareness-raising events. However, Staggenborg (2018) notes that most activities failed to develop into sustained campaign coalitions in part because it was difficult to find clear targets. Different priorities among a diverse set of social movement actors led to disparate mobilization efforts. In 2013, an effort to stop Allegheny County from leasing drilling rights within a public park provided an opportunity for coalition-building among professional EAOs such as the Sierra Club, PennEnvironment, Clean Water Action, and local anti-fracking EAOs, including MP. Yet, participation in the Protect Our Parks campaign declined significantly following a series of defeats.

Efforts to build a statewide anti-fracking movement faced similar coordination problems as those observed in Pittsburgh. Although environmental mobilization occurred

in many communities throughout the state, local anti-fracking movements had difficulty gaining momentum and largely failed to coalesce around a statewide campaign capable of fostering and sustaining mass mobilization. One of the first local anti-fracking EAOs to form in Pennsylvania was based in the central part of the state and sought to raise awareness about the risks of drilling within rural communities. Responsible Drilling Alliance (RDA) was formed in the fall of 2009 by a group of local landowners who became concerned about the shale gas boom after being approached to lease their land for drilling.<sup>13</sup> This group became an active participant in public hearings and worked with other local and professional EAOs on a campaign to oppose drilling in nearby state forest lands. Yet, RDA faced significant challenges from local residents who supported drilling, and its efforts remained relatively isolated from anti-fracking mobilization in other parts of the state. Within the Philadelphia area, Protecting Our Waters (POW) was another local anti-fracking EAO that formed early in the fall of 2009 after its founder learned about fracking at an environmental conference.<sup>14</sup> POW had a bit more success coordinating protests and other events with professional EAOs such as the Delaware Riverkeeper Network, PennEnvironment and Clean Water Action. Nevertheless, these actions largely remained focused on the Philadelphia area.

The stories of RDA and POW show that local efforts to build a movement against fracking were underway in Pennsylvania before the *Gasland* effect took hold in 2010 and 2011. Nevertheless, the majority of local anti-fracking EAOs formed after the movie

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<sup>13</sup> Personal interview with members of Responsible Drilling Alliance on July 31, 2013, Williamsport, PA.

<sup>14</sup> Personal interview with a member of Protecting Our Waters on October 23, 2013, Philadelphia, PA.

*Gasland* brought significant attention to the environmental and public health risks of fracking. In New York, *Gasland* supported an emerging consensus among activists in support of a statewide fracking ban, and added momentum to campaign coalitions that had already formed around the SGEIS process. By contrast, movement organizers in Pennsylvania lacked a coalition structure and focal campaign to capture the energy that *Gasland* catalyzed. The reality on the ground was not conducive to mobilization for a statewide fracking ban. Such a goal was next to impossible given that the industry was already well-entrenched in the state and very politically influential. Moreover, given the state's history of resource extraction, many environmental groups were simply unwilling to take such a radical stance.

To summarize, the preceding sections have analyzed the timing of movement emergence, and the motivations, opportunities and strategies of anti-fracking activists in New York and Pennsylvania. This analysis has found significant differences in the trajectories of these states' anti-fracking movements. The timing and location of the shale gas boom benefited New York activists who could observe the impacts of drilling in Southwestern Pennsylvania, and in other shale gas plays across the country. The unique history of the Catskill region also facilitated preemptive mobilization. The fact that shale gas drilling threatened the New York City watershed provided a context for integrating local emergent opposition with a broader environmental movement that included some of the largest EAOs in the nation. Finally, New York's moratorium and SGEIS provided a convenient focus to anti-fracking movement that helped to unite a diverse set of actors around a common goal.



Circumstances were quite different in Pennsylvania. There, the shale gas boom occurred alongside conventional drilling and in a region with a long history of fossil fuel extraction. This meant that shale gas drilling was well underway before environmental activists realized that UOGD and fracking posed unique environmental and public health risks. Although the natural gas boom led to LULU opposition as early as 2001, it was largely rooted in NIMBY grievances. Local environmental movements against shale gas drilling did not begin to take shape in Pennsylvania until after the political controversy over fracking emerged in New York. By 2009, local anti-fracking movements were beginning to organize in Pittsburgh, Philadelphia, and Central Pennsylvania. The movie *Gasland* helped expand opposition to fracking in Pennsylvania. Nevertheless, the movement suffered from limited resources and political opportunities, which stymied the development of broader coalitions and campaigns. In particular, lack of support for a fracking ban among the public and politicians made it difficult for movement organizers to identify clear targets that could support sustained campaign coalitions.

## THE STRUCTURE OF ANTI-FRACKING MOBILIZATION

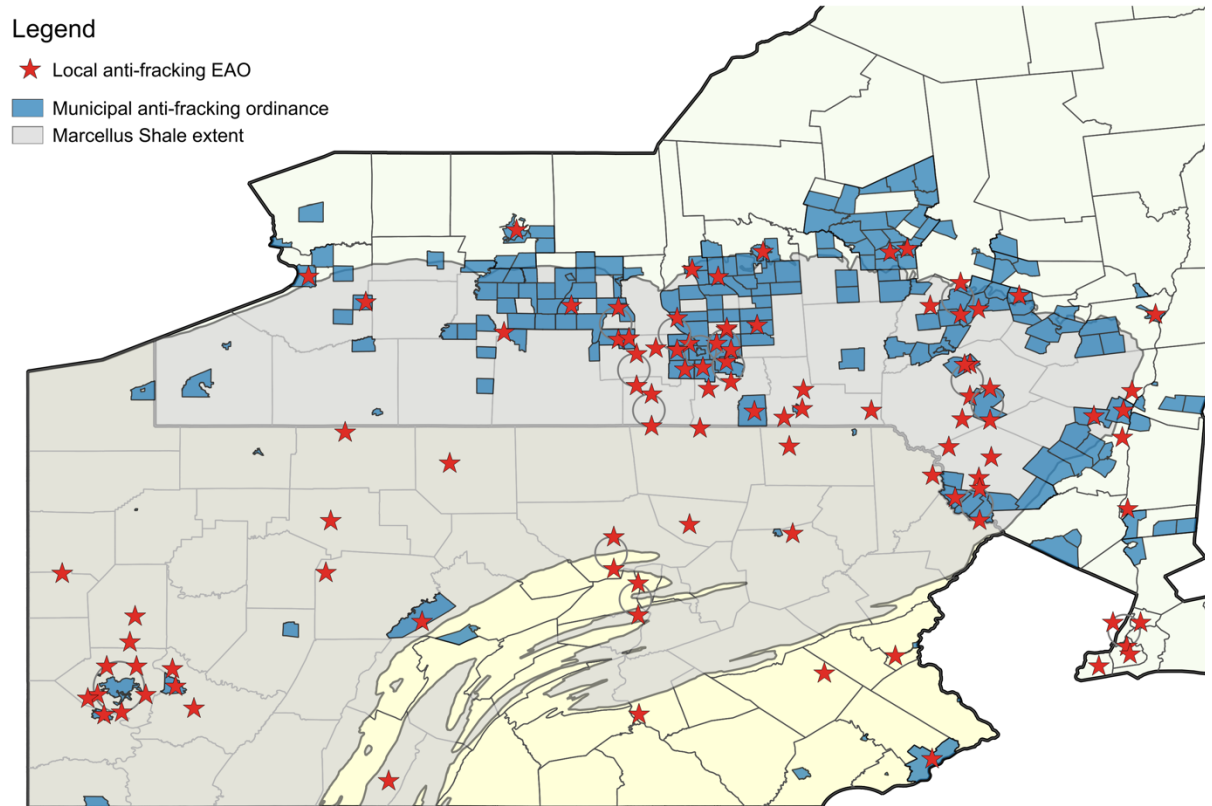
The preceding sections have shown that historical differences in natural resource extraction and urban influence led to divergent trajectories of anti-fracking mobilization in New York and Pennsylvania. This section examines the structure of mobilization in these states in order to show just how different these state's anti-fracking movements were. First, I illustrate dramatic differences in movement expansion by mapping local

anti-fracking EAOs and municipal fracking bans in each state. Next, I examine the discursive and political opportunity structures that activists in each state encountered. Previous research on anti-fracking mobilization in other energy dependent states suggests that Pennsylvania activists likely encountered hostility from local politicians, and faced pressure to conform to dominant policy frames that favored the industry and scientific experts (Auyero et al. 2017; Gullion 2015). Differences in the social movement frames of local anti-fracking EAOs in New York and Pennsylvania indicate that this is indeed the case.

New York and Pennsylvania present two very different structures of anti-fracking mobilization. In New York, preemptive mobilization by grassroots and professional EAOs sparked an expansive movement that integrated local campaigns with a statewide effort to ban fracking. By contrast, activists in Pennsylvania struggled at both the local and state-levels to attract participants, build sustained campaigns, and unify the movement. Figure 3.4 clearly shows that divergent movement dynamics led to dramatically different mobilization structures in New York and Pennsylvania. In New York, the fracking controversy inspired a popular grassroots movement that developed a strong organizational infrastructure and mounted an effective campaign to pass municipal anti-fracking ordinances throughout the state. In Pennsylvania, far fewer local anti-fracking EAOs formed and only a handful of municipal ordinances were passed. Local ban campaigns provided grassroots activists with an important organizing tool that helped to expand the anti-fracking movement. However, activists in Pennsylvania experienced greater challenges pursuing this tactic. Locally, few cities and towns in Pennsylvania were chartered under “home rule,” a designation accorded to almost all New York

municipalities. This created legal barriers to local fracking bans, which were reinforced by revisions to the Oil and Gas Law (Act 13) in 2012 that explicitly prohibited local land use ordinances regulating gas development. Although the Pennsylvania Supreme Court struck down these restrictions in 2013, other aspects of the law remained in effect, which denied municipalities that restrict drilling funds collected from the state's natural gas impact fee. This contributed to an already hostile political context that significantly dampened local anti-fracking mobilization in Pennsylvania.

Figure 3.4 Local Anti-Fracking Mobilization in New York and Pennsylvania



Source: Local anti-fracking EAOs collected by the author; Municipal anti-fracking ordinances obtained from Food and Water Watch

In Pennsylvania, there was significant support for the shale gas boom among community leaders, local stakeholders, and state politicians. Quiet mobilization in support of drilling described by Jerolmack and Walker (2018) created barriers to local anti-fracking mobilization. At the state-level, shale gas development was hailed by both democratic and republican political leaders as a major economic opportunity. Furthermore, natural gas was heavily promoted as a “clean energy” that had significant advantages over coal. Early on, many lawmakers in New York also framed the shale gas

boom in terms of economic development and clean energy. However, professional EAOs in New York offered a strong counter-weight to industry interests. For example, in 2009, the Sierra Club-Atlantic Chapter and the NRDC raised serious concerns about the environmental risks of drilling at a legislative hearing held in New York. In Pennsylvania, PennFuture and Pennsylvania Lands Trust also testified to legislators about the environmental impacts of drilling in 2009. However, these groups provided a much more positive picture of shale drilling that also emphasized the economic benefits of the industry. Chapter Four examines policy discourse and debates surrounding shale gas drilling in greater detail. This example shows that, in Pennsylvania, anti-fracking mobilization not only faced resistance from the industry and politicians, but also from influential segments of the state's environmental community. Research on local anti-fracking EAO frames further illustrates the challenges that Pennsylvania activists encountered.

#### *Discursive and Political Opportunity Structures*

My research on local anti-fracking EAOs further suggests that activists in Pennsylvania faced a more limited discursive opportunity structure than those in New York. The concept of *discursive opportunity structure* captures the confluence of political-cultural or symbolic factors that shape discursive framing processes, and facilitate and constrain social movement mobilization (Snow 2004). Movement actors face pressure to frame their activities in ways that align with ideas about what is reasonable, or legitimate within expert discourses, the media, and popular culture (Ferree

2003; McCammon et al. 2007). Activists may also exploit cultural products to create or expand discursive opportunities for themselves. In New York and Pennsylvania, activists not only encountered different sets of opportunities, but navigated and exploited them in different ways. I illustrate this by examining differences in the the creative appropriation of fracking and support for fracking bans among local anti-fracking EAOs in New York and Pennsylvania.

Grassroots activists in New York were much more willing to challenge the scientific and technical norms of policy discourse than were grassroots activists in Pennsylvania. Local activists in New York were also more willing to take an extreme or radical stance in favor of a statewide fracking ban. To some extent, these differences stem from real differences in the policy beliefs of grassroots environmental activists. However, they are also a product of particular strategic interactions between activists, policymakers, and industry actors, and therefore, can also be seen as responses to different discursive opportunity structures (Jasper 2012).

Table 3.4 displays the percentage of environmental claims that referred to “fracking” for each state. Surprisingly, there was a substantial difference in problem constructions between New York and Pennsylvania. Whereas almost all New York claims (90%) referred to “fracking”, only 38% of claims did so in Pennsylvania (chi-square  $p < .000$ ). The “fracking” frame provided two specific advantages to environmental activists. First, it focused collective action on a specific aspect of UOGD and helped unify disparate grievances into a common cause. Second, it was conducive to framings that balanced cultural resonance with strong challenges to existing states of affairs. These advantages are illustrated below.

Table 3.4 Issue Framing of Claims: Includes  
 “Fracking” by State, 2008-2013

	New York (%)	Pennsylvania (%)
Yes	88.89	38.00
No	11.11	62.00
Total Claims (N)	117	50
$\chi^2 = 16.35$ $p = 0.000$		

“Fracking” originated as an informal industry term for hydraulic fracturing, which activists creatively appropriated and used figuratively to promote a negative connotation (e.g., “Don’t Frack Your Mother,” “No Fracking Way!”). While activists’ use of the term reflects an emphasis on water contamination, “fracking” became an umbrella term for all activities related to drilling and completing a well. The introduction of this broader meaning into public discourse marked a victory for environmental advocates in an ongoing discursive contest between activists and drilling proponents. The gas industry, itself, provided an indicator of activists’ success. In 2014, the Marcellus Shale Coalition, an industry trade association, launched an ad campaign to counteract the negative connotations associated with the term, which explicitly stated that “fracking’s a good word” (Maykuth 2014). Although social movement framings of “fracking” have prevailed in popular discourse, the term “hydraulic fracturing” is largely used in expert discourse, where the gas industry has exploited its technical meaning to refute activists’ claims of contamination (Litvak 2014; Manthos 2013). Unsurprisingly, policy experts aligned with the oil and gas industry have criticized the term “fracking” as detracting from intelligent dialogue about the risks of drilling (Bailin 2013; Jaffe 2013).

Scientific and technical discourse dominates environmental policy debates, and has power over policy decisions. This is true within political institutions, and within the environmental movement, which has long prioritized expert knowledge and professional advocacy over community activism (Bosso 2005; Gottlieb 2005). Grassroots organizations face pressure to adopt the repertoires of mainstream politics in order to be seen as legitimate actors by political decision-makers, and major environmental organizations and foundations. The fact that a smaller percentage of claims in Pennsylvania utilized the “fracking” frame suggests that activists in this state faced greater pressure to conform to scientific and technical norms that benefited the gas industry.

Personal interviews with representatives of local anti-fracking EAOs show that, as late as 2013, Pennsylvania activists perceived the term “fracking” as lacking legitimacy within political discourse. For example, an organizer from RDA noted that “the word really resonates with people, so its used, but for a longtime was attacked because ‘those people don’t even know what they are taking about.’” Similarly, when speaking about an ongoing review of “fracking” by the Environmental Protection Agency (EPA), an activist from POW clarified “we always use the term hydraulic fracturing or shale gas drilling.” By contrast, community group leaders in New York strategically appropriated the term “fracking” in a process of naming that transformed the unperceived risks of shale gas drilling into a subject of dispute (Earl 2009). One organizer from the Coalition to Protect New York, a group based in Ithaca New York, commented that the industry “scoffs at us for not knowing the right word”, but went on to reaffirm the “fracking” frame by explaining that “its not their word. Its our word. It discusses the fracturing of not only the



shale with chemicals ... but also the fracturing of our water, air, food supply, and communities.”<sup>15</sup> Community groups in New York appeared to have understood the strategic advantages of the term “fracking”, and took the offensive in discursive contests with the gas industry. By contrast, local activists in Pennsylvania were sensitive to industry attempts to de-legitimize the term.

Emphasis on “fracking” was politically advantageous because it differentiated shale gas drilling from conventional gas drilling. Fracking could be legitimately described as falling outside of established regulatory frameworks, especially since the Energy Policy Act of 2005, exempted hydraulic fracturing from most federal environmental regulations. Political claims opposing “gas drilling” could be neutralized more easily with counter-arguments highlighting the established and regulated nature of the gas industry. Furthermore, gas drilling proponents commonly targeted opposition groups as affluent NIMBY (Not-in-My-Backyard) activists. Problem constructions that focused on “fracking” shifted the debate to broader environmental concerns. The term highlighted environmental and public health risks from “toxic” chemicals, radioactive waste, and earthquakes that were easily connected to broader discursive frames of technological risk, environmental health, and environmental justice (Freudenburg and Pastor 1992; Brulle et al. 2007).

The fracking frame was rhetorically powerful and benefited activists efforts to socially construct shale gas drilling as a technological risk. The personal interviews that I conducted suggest that Pennsylvania activists hesitated to use this frame, in part, because

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<sup>15</sup> Personal interview with a member of Coalition to Protect New York and ShaleShock Citizens Action Alliance on November 20, 2013, Ithaca, NY.

they felt more pressure to conform to the norms of scientific discourse. Yet, these norms privileged industry interests. Activists in New York strategically coopted and redefined the term fracking. Their willingness to challenge the authority of industry experts, to some extent, reflected the advantaged position of environmental activists. The institution of a moratorium on fracking in New York in 2008 allowed activists in this state to take the offensive. By contrast, in Pennsylvania, there was strong political support for the rapid expansion of intensive energy development (Rabe and Borick 2013). This placed Pennsylvania activists at a severe disadvantage.

Within both states, the discursive opportunity structure reflected broader political realities. In New York, grassroots activists had support from major EAOs and political elites based in New York City. A preemptive moratorium on fracking also led activists to see a fracking ban as a real possibility in New York. In Pennsylvania, numerous shale gas wells were drilled before an anti-fracking movement emerged. This combined with the political influence of the gas industry gave activists little hope that the state would ever ban fracking. Professional EAOs were also more supportive of shale gas drilling in this state. As a result, grassroots activists felt pressure to adopt more moderate political positions. In particular, this led to conflicts among Pennsylvania activists over whether or not to support campaigns for state and local fracking bans. My research indicates that such conflicts hampered movement expansion in Pennsylvania.

Pennsylvania activists whom I interviewed noted that tension over whether or not to support a fracking ban inhibited coalition-building. For example, a 2012 effort to form an alliance of environmental groups called Pennsylvanians for Clean Land, Air, and Water (PA-CLAW) “never got off the ground” because of framing disputes. A

representative from RDA described PA-CLAW's initial meeting as a "day fraught with frustration and argument about what do we call for, what do we stand for, who are we, how do we make this work."<sup>16</sup> Similarly, a representative of Berks Gas Truth associated the failure of PA-CLAW with a lack of consensus over goals, noting that use of the word "moratorium would be the thing that would drive other groups out of organizing something together."<sup>17</sup> Framing disputes also hindered collaboration between activists in Pennsylvania and New York. A representative of POW described a meeting of grassroots activists from Pennsylvania and New York held in 2011, which "broke down almost immediately" due to disagreements over whether or not to support a ban.<sup>18</sup>

This research indicates that distinct political and discursive opportunity structures in New York and Pennsylvania significantly influenced the framing and strategies of activists in these states. In New York, activists were inspired by the 2008 moratorium to pressure the governor for a fracking ban both directly, and via the environmental review process. While not all New York EAOs actively sought a fracking ban, most explicitly or implicitly supported this goal. As a result, the New York anti-fracking movement developed strong campaign coalitions that worked together to mobilize activists across the state. By contrast, Pennsylvania activists faced a discouraging political context with few governmental allies or institutional means to challenge established policy. As a professional organizer from PennEnvironment observed, "people are feeling pretty defeated and hopeless. They feel like Governor Corbett is not going to do anything right

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<sup>16</sup> Personal interview on July 31, 2013, Williamsport, PA.

<sup>17</sup> Personal interview on September 27, 2013, King of Prussia, PA.

<sup>18</sup> Personal interview on October 23, 2013, Philadelphia, PA.

when it comes to this issue, and the legislature is not.”<sup>19</sup> This situation led many Pennsylvania activists to either adopt more moderate positions or give up the fracking fight altogether. The lack of a clear goal or target at the state-level complicated efforts to unify Pennsylvania activists around a common cause. As a result, the Pennsylvania anti-fracking movement remained small and fragmented.

#### PATH DEPENDENT MOVEMENT TRAJECTORIES

The New York and Pennsylvania anti-fracking movements present a stark contrast. In New York, preemptive mobilization against shale drilling developed into a popular and unified anti-fracking movement. A synergy developed between grassroots and professional EAOs that made the movement politically relevant. On the one hand, local movement organizers formed anti-fracking groups and mobilized sympathizers to participate in public comment periods and support local ban campaigns. At the same time, professional EAOs lobbied political decision-makers to recognize the public health implications of shale gas drilling. In New York, these efforts culminated in a statewide ban on fracking in 2015. The Marcellus Shale gas boom did not spark environmental mobilization in Pennsylvania until 2009, after the political controversy over fracking emerged in New York. Thus, the shale gas industry was well-entrenched in the state by the time efforts to organize an oppositional movement were underway. Although local anti-fracking movements emerged in Pittsburgh, Philadelphia, and Central Pennsylvania,

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<sup>19</sup> Personal interview on December 19, 2013, Philadelphia, PA.

they struggled to link up and form a broader movement. The political and economic influence of the gas industry in Pennsylvania limited the political and discursive opportunities of movement organizers. Pennsylvania activists struggled to craft a strong message and a coordinated campaign against fracking. As a result, the Pennsylvania anti-fracking movement garnered few concessions from the gas industry or politicians.

Different movement trajectories in these states were to some extent path dependent. Distinct histories of natural resource extraction and urban influence in New York and Pennsylvania led to very different contexts of mobilization, which significantly shaped the structure of each state's anti-fracking movement. Historically, Pennsylvania was a major producer of coal, and to a lesser extent, natural gas. Coal mining, in particular, had lasting cultural, environmental, and political influences on the state. The shale gas boom began in Western Pennsylvania, a region that was familiar with fossil fuel extraction, and therefore, initially did not attract much attention. It was not until shale gas drilling expanded to areas unfamiliar with drilling in Northeastern Pennsylvania and New York's Southern Tier that opposition to fracking emerged. The anti-fracking movement first developed in New York as a result of proposed drilling within the Catskills, and most importantly, New York City's watershed. This provided a context for integrating LULU opposition with broader environmental concerns. New York's urban elite has long sought to maintain the environmental quality of the Catskill region. This contributed to pre-existing cooperative relationships between local EAOs and major EAOs based in New York City that provided activists with significant material resources and political capital. In Pennsylvania, increased public awareness of the environmental threats of shale gas drilling led to anti-fracking mobilization by grassroots and professional EAOs. Yet,

the apparent inevitability of shale gas drilling created significant barriers to mass mobilization.

A minimalist approach to path dependence is most appropriate for understanding how enduring patterns of resource development and elite influence shaped movement trajectories in these states. A minimalist approach to path dependence does not make strong theoretical claims about the causal mechanisms that produce a historically determined sequence of events. Rather, it relies on weaker assumptions about the durability of event cascades. The environmental histories of New York and Pennsylvania were shaped by distinct sequences of events that made some future possible event sequences more likely than others. New York's path of environmental preservation and Pennsylvania's path of carbon dependence narrowed collective actors' range of choices. Yet, options for action remained contingent, particularly in the face of unexpected events. This added a certain dynamism to the rolling inertia of pre-existing patterns. Most notably, in New York, the 2008 moratorium provided activists with an unexpected victory that provided time and inspiration to mobilize. The fact that *Gasland* was acquired by HBO and nominated for an Oscar award contributed significantly to its popularity. In turn, the film became an important educational tool that sparked anti-fracking mobilization in both states. The overall trajectory of the anti-fracking movement in New York and Pennsylvania was determined by the particular ways that these and other contingencies interacted with pre-existing structures as sequences of events unfolded overtime. By providing a thick description of these sequences, this chapter has shown how "history mattered" for each state's anti-fracking movement.

## CHAPTER FOUR

### EXTRACTIVE HISTORIES, INTEREST MOBILIZATION, AND SHALE POLICY DIVERGENCE IN NEW YORK AND PENNSYLVANIA

In this chapter, I begin to answer the central question that motivated this study: Why did policymakers in New York and Pennsylvania respond to the Marcellus Shale gas boom in such dramatically different ways? I have noted several times previously that New York took a precautionary approach to regulation by imposing a moratorium and eventual ban on fracking, while Pennsylvania adopted policies that supported the rapid expansion of shale gas development. The following analyses explain shale policy divergence in these states by situating the decisions of Pennsylvania and New York policymakers within historical context. I argue that distinct histories of natural resource extraction and urban influence created significantly different contexts of interest group mobilization and political decision-making in these states, which in turn led to different shale policy decisions. I employ a minimalist path dependency framework to illustrate how history mattered in each state. The analysis involves a comparative case study of the policy status quo prior to the shale gas boom, how the political controversies over fracking influenced this status quo, interest group mobilization, and the particular decisions that led to shale policy divergence in New York and Pennsylvania.

The rapid expansion of shale energy development and unconventional drilling increased attention to how U.S. states regulate the environmental impacts of oil and gas development. In recent years, scholars have sought to understand why some states have revised their regulations while others have not, and why some states have adopted more

stringent policies than others. Most researchers use case study methods to examine how contextual factors and interactions among interests groups and political decision-makers shape shale policy development (some important examples are Davis 2012; Heikkila et al. 2014; Weible and Heikkila 2016). A few quantitative studies have examined the role of political and economic structures (Davis 2017a; Fisk 2013; Richardson et al. 2013). Yet, there is little research that considers how states' extractive and environmental histories influence shale policy development (see Rabe and Borick 2013 for an important exception).

This lack of attention is surprising, since it is widely recognized that energy dependent states tend to possess environmental regulatory regimes that are favorable towards extractive industries (Davis 1993; Rabe and Mundo 2007). Researchers have found that the oil and gas industry has considerable influence over shale policies in major energy producing states (Cook 2014; Rabe and Borick 2013). However, most studies provide a “snapshot” view that fails to place contemporary events within a longer historical context. This research argues that the longer extractive and environmental histories of states are a key factor shaping shale policy development. Historical patterns of industry influence, resource management, and environmental interests significantly influence the political context of policymaking, and inevitably shape the choices of policy actors. Understanding how “history matters” is particularly important for research on shale policy since unconventional drilling has increased oil and gas production in states where extractive industries have minimal or declining economic influence. This situation highlights the fact that, even in major energy producing states, the political



influence of the fossil fuel industry often far exceeds its relative contribution to a state's economy (Hochschild 2018).

This research takes advantage of a unique comparative case analysis of shale policy divergence to examine how the historical context of political decision-making influences shale policies. New York and Pennsylvania sit atop the Marcellus Shale, which is one of the most important shale energy plays in the United States. As I have stated several times previously, while Pennsylvania experienced extensive shale energy development, none occurred in New York due to a preemptive moratorium imposed in 2008. In 2015, New York became the first, and to date, the only state with substantial shale energy resources to ban unconventional drilling. Pennsylvania, like most states, allowed shale gas development to proceed while stronger regulations were slowly developed and implemented. In the end, Pennsylvania adopted policies that supported the rapid expansion of unconventional drilling, a series of decisions that were also typical of major shale producing states. A study of these two states allows for the comparison of a typical case (Pennsylvania) and the deviant case (New York) of shale policy development.

The concept of path dependence provides a theoretical framework for understanding how these states' extractive and environmental histories influenced shale policy development. Path dependence refers to the idea "that what has happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time" (Sewell 2005: 100). The basic assumption of path dependence is that historical patterns (e.g., of action, social relations, and meaning) constrain those that occur in the future. Within the social sciences, the concept may also refer to a more

narrow set of event sequences in which choices or conditions at “critical junctures” produce a dynamic of increasing returns that “lock-in” contingent trajectories of development (Arthur 1989; Pierson 2000, 2011). Many scholars argue that a “strong” approach to path dependence is more rigorous and preferable to less restrictive definitions. I challenge that notion here.

This research employs a “minimalist” approach to path dependence, which makes fewer assumptions about the structure of path dependent sequences or the particular mechanisms that cause them. Shale policy development in New York and Pennsylvania illustrates the value of a minimalist approach to path dependence. In these states, shale policies were not determined by “self-reinforcing processes” or “institutional lock-in,” but rather by how distinct extractive and environmental histories combined with trends in political partisanship, interest group mobilization, contingent events and particular strategic actions.

The previous chapters described how different histories of natural resource extraction and urban influence led to a path of carbon dependence in Pennsylvania and a path of environmental preservation in New York. The current chapter furthers the analysis of path dependence by considering how these distinct historical patterns influenced key policy decisions on shale gas drilling and fracking in each state. Evidence for path dependence is provided by examining differences between states in the oil and gas policy status quo, legislative attention to oil and gas issues, and the dynamics of interest group mobilization.

A description of policymakers’ early responses to the shale gas boom reveals that the policy status quo in both states initially supported increased oil and gas production.

However, political support for drilling was much weaker in New York because resource extraction was historically insignificant to the state's economy. Pennsylvania traditionally had much higher levels of oil and gas production. As a result, more policymakers took an interest in the industry, and given the state's history of coal mining, were predisposed to support shale gas drilling. In New York, a weak policy settlement combined with strong anti-fracking mobilization and Democratic party control to support a policy path that eventually led to a statewide fracking ban. Shale policy development in Pennsylvania followed an opposite pattern. In Pennsylvania, political support for drilling was rooted within economic calculations shaped by the historical dominance of the fossil fuel industry. Environmentalists offered few challenges to the policy status quo, and Republican party control favored gas industry interests. Consequently, Pennsylvania's shale policies prioritized the expansion of unconventional drilling over the reduction of environmental risk.

This chapter further describes shale policy dynamics in these states, and illustrates how path dependence helps account for shale policy divergence. After describing the theoretical framework, data, and analytical approach, I consider how the policy status quo guided initial responses to the Marcellus Shale gas boom in each state. Next, I analyze legislative attention to oil and gas policy issues before and after the shale gas boom and demonstrate the disruption of the policy status quo in New York, and its enforcement in Pennsylvania. Then, I examine interest mobilization within legislative hearings that addressed the Marcellus Shale. This is followed by an analysis of the political dynamics surrounding key policy events in each state, which combines multiple causes of shale policy outcomes into a coherent narrative of path dependence. The chapter concludes

with a brief discussion of the broader implications of this study's findings for shale policy development in other states.

## THEORETICAL FRAMEWORK

In Chapter One, I provided a more detailed discussion of path dependency theories and described the minimalist approach employed in this study. In this section, I briefly reiterate the main theoretical ideas guiding this research. Path dependence has various meanings within the social sciences. Within institutional theory in economics and political science, path dependence is commonly characterized as “those historical sequences in which contingent events set into motion institutional patterns or event chains that have deterministic properties” (Mahoney 2000: 507). Path dependency is often further specified as involving self-reinforcing mechanisms or a process of increasing returns (Arthur 1989; Pierson 2000, 2011). An alternative approach makes fewer assumptions about the structure of path dependent sequences or the particular mechanisms that cause them. Such perspectives, often termed “weak” or “soft”, begin with the uncontroversial idea that historical event sequences shape how future events unfold.

Minimalist versions of path dependence have been criticized as a vague form of historical explanation (Mahoney 2000; Pierson 2011). Nevertheless, minimal definitions are more flexible. This may have advantages, especially for scholars who are interested in a wider range of temporal concepts and ideas (Mahoney and Schensul 2006). For

example, Sewell proposes an “eventful conception of temporality...that assumes that social relations are characterized by path dependency, temporally heterogeneous causalities, and global contingency” (Sewell 2005: 102). In this case, it seems that a soft version of path dependence is preferred because it is adaptable to a mode of historical explanation or interpretation that “not only specifies multiple causes but sorts out what might be characterized as different registers of causation: preexisting structural conditions (cultural, social, demographic, and economic); conjunctural conditions ...; and contingent strategic or volitional actions” (Sewell 2005: 109).

A minimalist approach to path dependence is particularly useful when one is not looking for general mechanisms, but is interested in describing how broad historical patterns shape the unfolding of particular trajectories. Thus, path dependence provides a metaphor that aides in the ordering of events and actions in such a way that renders phenomena intelligible. Following Kay, “a metaphor can help improve a policy story by providing reasons” (2005: 565). It is in this sense that I use path dependence to provide a rationale and an explanatory context for action.

This approach is particularly well-suited to the analysis of shale policy development in New York and Pennsylvania. Prior to the shale gas boom, these states’ policy institutions were similarly founded upon the idea that the economic benefits of oil and gas development outweighed the potential environmental risks. Therefore, the notion of “institutional lock-in” is insufficient for understanding why these states adopted such dramatically different shale policies. Rather, one must consider how distinct histories of resource extraction and urban influence influenced social actors’ responses to the shale gas boom, and why these responses disrupted the policy status quo in New York, but not

in Pennsylvania. Multiple factors led to shale policy divergence in these states. I examine how trends in political partisanship, interest group mobilization, contingent events and particular strategic actions, came together to produce distinct policy trajectories. By describing these factors against the backdrop of each state's extractive and environmental history, I show how these trajectories were, to some extent, path dependent.

## DATA AND ANALYTIC APPROACH

This research involved multiple stages of data collection and analysis that sought to describe the historical and discursive context of shale policy development, and the political dynamics shaping shale policy decisions in New York and Pennsylvania. The analysis of historical influence and environmental mobilization in this chapter builds upon findings presented in Chapter Two and Chapter Three. This chapter also incorporates findings from additional qualitative research on key policy decisions, policy framings, legislative attention, and interest group mobilization. This section briefly describes primary data sources that have not been discussed in previous chapters.

### *Proposed Oil and Gas Legislation*

Proposed oil and gas legislation provides a measure of legislative attention. Legislative proposals offer insight into the nature of policy settlements and the degree of consensus over the policy status quo. The content of proposed legislation reveals how

political decision-makers define and frame policy issues, and suggests the terms of policy debates. The passage of bills and resolutions by legislative chambers provides information about dominant policy positions and framings. A descriptive analysis of legislative proposals also serves to narrow the collection of textual data on agenda-setting and conflict over oil and gas policy in New York and Pennsylvania.

I obtained legislative data from the websites of the New York State Legislature and the Pennsylvania General Assembly, and the Pennsylvania Policy Database Project (McLaughlin et al. 2010). A particular piece of legislation may address multiple policy issues. I focused on bills and resolutions, which had oil and gas exploration and production as the primary topic.<sup>20</sup> Other bills were only included if their enactment resulted in a revision to oil and gas law.<sup>21</sup> Since legislators often introduce more pieces of legislation in the first year of a two-year session, the data are grouped in two-year increments so that patterns of legislative attention are easier to recognize. Proposed legislation was categorized by subtopic based upon a qualitative review of the abstract, text, and when available, the sponsor's memo for each bill. Subtopics are further described in the following analytical sections.

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<sup>20</sup> This conformed to the coding of bills and resolutions by the Pennsylvania Policy Database Project.

<sup>21</sup> Only one such bill was observed in Pennsylvania, and was discovered through a review of revisions to PADEP's oil and gas regulations.

## *Legislative Hearings*

Legislative hearings provide additional information about key policy actors, political positions, policy framings, and interest group mobilization around shale drilling issues. This analysis includes hearings held by the Pennsylvania House of Representatives and the New York State Assembly, which had oil and gas exploration and development as the primary topic. For Pennsylvania, legislative hearings were identified through the Pennsylvania Policy Database Project (McLaughlin et al 2010). Hearing transcripts were obtained from the Pennsylvania General Assembly's website. New York State Assembly hearings were identified through the New York State Library. In most cases, transcripts were available through the library's website. I also visited the New York State Library in Albany, NY and personally digitized some transcripts.

Hearing transcripts were utilized to identify and categorize witnesses into relevant interests. This is an approach commonly used by policy process scholars to study policy change, interest group alignments, and the composition of policy subsystems (Baumgartner and Jones 2009; May, Sapotichne, and Workman 2009; Worsham 2006; Zafonte and Sabatier 2004). I manually reviewed testimony and categorized all witnesses into relevant interests. A qualitative analysis of hearing testimony provided information about the policy positions and framings of key policy actors. Time and resource limitations prohibited systematic coding of testimony, which included thousands of pages of textual material. Nevertheless, my initial reading of the transcripts while coding interest participation was sufficient to identify key actors and policy statements, which were incorporated into the current analysis. Appendix B contains additional information about the legislative hearing data.



### *Analytic Approach*

This research employs qualitative methods and a process of triangulation to analyze shale policy development. Qualitative analysis is an interpretive process that involves stages of describing, organizing, connecting, corroborating/legitimizing, and representing the account (Crabtree and Miller 1999). Triangulation refers to the use of multiple research methods and types of data to answer the same question (Ayoub, Wallace, and Millán 2014). I use data and analyses from previous chapters, as well as, textual data from legislative proposals and hearings to construct a timeline of policy events, characterize shale policy debates, and describe interest group mobilization in New York and Pennsylvania. Through triangulation, I establish the credibility of my interpretations by drawing upon multiple forms of data, “accounts” of events, and by comparing across cases (Flick 1992; Seale 1999). The final narrative represents the cumulative understanding that is achieved through iterative stages of describing, comparing, and analyzing shale policy dynamics across New York and Pennsylvania.

### THE POLICY STATUS QUO

Historically, within the U.S., federal and state natural resource policy has prioritized economic development over environmental protection (Andrews 2006). Fossil fuel extraction is especially subject to a hegemonic policy frame that prioritizes economic benefits over environmental risk. Although concerns over climate change have

introduced alternative narratives related to renewable and “clean” energy, energy policy remains dominated by a concern for energy abundance, affordability, and security that, according to the energy industry, only fossil fuels can provide (Huber 2013; Ladd 2016). Thus, even in states with few mineral resources, the policy status quo tends to be supportive of fossil fuel extraction. Chapter Two provided a history of oil and gas policy in New York and Pennsylvania, which illustrated political support for fossil fuel extraction in both states. In this section, I show that this policy status quo guided policy actors’ initial responses to the Marcellus Shale gas boom. The discussion serves to show that shale policy divergence was not an outgrowth of pre-existing policy institutions, and prefaces this chapter’s examination of a more complex interplay between history, politics, contingency, and collective action.

### *Support for Drilling as the Default Position in New York*

In New York, the policy status quo is revealed by legislation that was adopted in 2005 and 2008, which facilitated oil and gas development. In 2005, New York made significant revisions to laws governing well spacing and unitization, and compulsory integration, which were motivated by a conventional drilling boom within the Trenton Black-River formation.<sup>22</sup> Chapter 386 of 2005 was intended to ensure the economic and

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<sup>22</sup> Unitization and well spacing requirements establish the size of drilling units and the setback distance between a well and the boundaries of adjacent spacing units. Unitization and well spacing regulations help ensure that wells do not drain oil and gas from adjacent spacing units, thus allowing for a more efficient recovery of the resource and less land disturbance. Compulsory integration forces non-leased owners to participate in a spacing unit and is intended to protect the correlative rights of landowners and allow for the creation of efficient spacing units.

efficient recovery of oil and gas resources, reduce uncertainties associated with well development, and encourage the expansion of the oil and gas industry in New York State (New York State Legislature 2005). Chapter 386 of 2005 passed unopposed in both legislative chambers, and was quickly signed into law by republican Governor George Pataki. The degree to which the legislation favored the oil and gas industry is reflected by the fact that the bill jacket contained letters from 20 oil and gas companies and the Independent Oil and Gas Association of New York expressing enthusiastic support for the measure.

Well spacing revisions passed in 2005 did not foresee horizontal drilling within the Marcellus Shale, and therefore, the majority of proposals for such wells did not conform to existing statewide spacing requirements. Consequently, for each proposed Marcellus Shale well, the New York State Department of Environmental Conservation (NYSDEC) would have had to provide public notice, allow public comment, and possibly hold a public hearing prior to permitting. To remove this regulatory burden and facilitate development of the Marcellus Shale, the NYSDEC requested revisions to well spacing requirements. In May 2008, bipartisan legislation was introduced into the New York State Legislature that modified well spacing requirements for horizontal wells. Chapter 376 of 2008 passed in both chambers by mid-June, and was signed into law by democratic Governor Paterson on July 21, 2008.

Unlike previously enacted oil and gas legislation, Chapter 376 of 2008 did not pass unopposed. In the New York State Assembly, 135 legislators voted in favor, and 7 opposed the legislation. In the New York State Senate, it received 45 favorable and 16 unfavorable votes. Horizontal well spacing revisions occurred just as public concern over

shale gas drilling began to emerge in New York. The voting record shows that oppositional mobilization by concerned citizens and environmental advocacy organizations (EAOs) presented an immediate challenge to the policy status quo.

The Sierra Club Atlantic Chapter, the Natural Resources Defense Council (NRDC), and Catskill Mountainkeeper, mounted a last ditch effort to oppose horizontal well spacing revisions, which they only became aware of as the legislation came up for a vote.<sup>23</sup> These groups actively lobbied Governor Paterson to veto the bill. While their effort was unsuccessful, the governor ordered the NYSDEC to complete a supplemental generic environmental impact statement (SGEIS) on high-volume hydraulic fracturing (HVHF) and horizontal drilling prior to permitting any Marcellus Shale wells. In a later section, I consider in greater detail how environmental mobilization disrupted the policy status quo, and forced many New York politicians to examine what had been a default position in favor of oil and gas development. Here, it is important to note that “economic development” remained the dominant policy frame at the beginning of the SGEIS process.

Governor Paterson’s decision to delay shale gas drilling until the completion of the SGEIS was consequential, and eventually led to a statewide fracking ban. Yet, at the time, few expected this outcome. Indeed, statements made by the governor and NYSDEC officials reflected continued commitment to the policy status quo. Regarding his decision to approve the 2008 horizontal well spacing law, Governor Paterson noted:

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<sup>23</sup> Personal interview with a representative of the NRDC on December 12, 2013, New York, NY.

This new law will ensure greater efficiency in the processing of requests to permit oil and gas wells, while maintaining environmental and public health safeguards ... Natural gas exploration has the potential to increase domestic supplies of natural gas, create jobs, expand the tax base and benefit the upstate economy. (Decordova 2008: 1)

NYSDEC Commissioner Peter Grannis expressed a similar position in a letter published in the Post-Standard (Syracuse, NY) on August 12, 2008. Grannis noted New York's long history of oil and gas development, and sought to assure the public that gas drilling was safe and well regulated. His statement highlighted the competency of NYSDEC's "mineral resources professional staff – averaging 22 years of experience per person", and how "New York's rigorous regulatory process" had prevented "the types of problems that have occurred in states without strong environmental laws" (Grannis 2008: A15).

Governor Paterson initially gave the NYSDEC about a year to complete the SGEIS, and it was generally expected that development of the Marcellus Shale would proceed with additional regulation. In fact, oil and gas operators in New York continued to show interest in conventional formations below the Marcellus, which were not subject to the moratorium, as a way to lay claim to parts of the Marcellus, and develop the infrastructure and lease holdings to produce it (Wilber 2012). Interest in New York's oil and gas reserves would eventually fade as the anti-fracking movement gained momentum and the SGEIS process dragged on. Yet, at the beginning, there was little expectation that

environmental opposition would upset a longstanding policy settlement based on the assumed benefit and inevitability of fossil fuel extraction.

### *Enforcement of the Policy Status Quo in Pennsylvania*

Pennsylvania did not adopt major oil and gas legislation in the years preceding the Marcellus Shale gas boom. However, a policy status quo supportive of drilling was evident in the leasing of state forest lands for shale gas development. Pennsylvania possesses about 2.2 million acres of public forest land, and owns both the surface and subsurface rights to about 1.8 million acres. Historically, there has been high demand for state oil and gas leases in Pennsylvania, and the state has aggressively pursued leasing as a source of funds. This pattern continued with the Marcellus Shale gas boom when democratic Governor Ed Rendell utilized state lease sales to address the state's budget crisis. Furthermore, political pressure to expand oil and gas drilling on state forest lands overrode efforts by the Pennsylvania Department of Conservation and Natural Resources (DCNR) to reduce forest fragmentation related to oil and gas activities. I describe these policy events in order to show that, in Pennsylvania, the dominant policy frame for oil and gas drilling prioritized economic benefit over environmental protection.

The Marcellus Shale gas boom led to two state lease sales: a 2008 sale of 74,000 acres for a bonus bid of about \$5.9 million, and a 2010 sale of 64,000 acres for a bid of about \$255 million.<sup>24</sup> Both lease sales were promoted by democratic Governor Ed

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<sup>24</sup> A bonus bid refers to a bonus that is paid on new leases, typically determined through a competitive sealed-bid auction.

Rendell as positive contributions to the state budget. The 2008 lease sale came as Pennsylvania faced a major budgetary shortfall and was hailed by democratic Governor Ed Rendell as a means to boost the state's finances (Swift 2008). A similar pattern was repeated in 2010 when Rendell championed another lease sale as part of a budget deal with top Senate Republicans (Levy 2010). This move did not sit well with some House Democrats who expressed concern over environmental impacts, and proposed legislation to place a five-year moratorium on further state forest leasing (Levy 2010; Vitali 2010). While concerns over state lease sales gained some political traction, the proposed State Forest Natural Gas Lease Moratorium Act died in committee in 2010, as would other attempts to address the issue.

In Pennsylvania, the leasing of state forest lands shows that economic incentives trumped environmental concerns when it came to oil and gas development. This point is made clear when one considers that the 2008 lease sale occurred alongside regulatory backsliding within DCNR on gas drilling issues. In 2008, DCNR backed away from a 2003 moratorium on new shallow wells on state forest land (Associated Press 2008). DCNR's shallow well moratorium was intended to limit forest fragmentation associated with new wells sites and access roads. However, this policy immediately experienced push back from the gas industry and lawmakers.

In 2003, the legislature ordered the Pennsylvania Joint Legislative Air and Water Pollution Control and Conservation Committee (JLCC) to study DCNR's moratorium. Through this process, legislators and the gas industry successfully pressured the agency to modify its policy "to accommodate natural gas exploration and production in all available geological horizons underlying the State Forest system" (JLCC 2006: 14). In

2008, DCNR's public statements about state lease sales showed little concern for forest fragmentation. Rather, the agency defended drilling on state lands by highlighting that "natural gas is the cleanest-burning fossil fuel" and that "the agency recognizes the need for energy independence, as well as the need to protect the forests" (Associated Press 2008: 1).

In Pennsylvania, a policy status quo in support of gas drilling was actively enforced by the governor and legislature. The governor aggressively pursued the leasing of state forest lands as a source of state funds, and championed the Marcellus Shale gas boom as an economic windfall for the state. DCNR's moratorium on shallow wells made some attempts to minimize the negative impact of drilling within state forests. However, the agency faced significant pressure from lawmakers and the gas industry to lift restrictions on drilling. In Pennsylvania, the Marcellus Shale gas boom unfolded within a policy environment dominated by a pro-drilling narrative that emphasized the economic benefits of the gas industry while largely neglecting its environmental risks. This will be further demonstrated in the following section.

#### DISRUPTION AND PERSISTENCE: LEGISLATIVE ATTENTION BEFORE AND AFTER THE SHALE GAS BOOM

In New York and Pennsylvania, the policy status quo prior to the Marcellus Shale gas boom was favorable towards oil and gas development. However, policymakers' support for gas drilling was rooted in very different circumstances. In New York, support



for drilling was a default position among politicians who were unfamiliar with oil and gas development. Gas drilling was minimal within the state and limited to a few counties (see Chapter Three). New York's policy status quo was rooted within a dominant narrative that simply took fossil fuel extraction, and its benefits, for granted. As a result, the pro-drilling policy frame in this state was more vulnerable to challenge. In Pennsylvania, where extractive industries were historically dominant, the situation was quite different. Gas drilling occurred at a much higher level and was more geographically dispersed. Accordingly, more lawmakers had incentive to support pro-drilling policies in Pennsylvania than in New York. Furthermore, Pennsylvania's history of fossil fuel extraction, particularly coal mining, left a political, cultural, and environmental legacy that predisposed policymakers towards support for the gas industry. This section uses proposed oil and gas legislation to illustrate how, in New York, the shale gas boom led to the disruption of the policy status quo, while in Pennsylvania, a longstanding policy settlement that favored the gas industry persisted.

Prior to the Marcellus Shale gas boom, oil and gas policy received relatively little attention from policymakers in both New York and Pennsylvania. Table 4.1 displays data on proposed oil and gas legislation in these states from 1995 to 2016. Prior to the shale gas boom, oil and gas policy issues received somewhat more attention from New York lawmakers. From 1995 to 2008, New York legislators introduced on average almost 7 oil and gas bills and resolutions per legislative session for a total of 48 legislative proposals. In Pennsylvania, lawmakers introduced an average of 4.3 bills and resolutions per legislative session for a total of 28 legislative proposals. Overall, these figures show that oil and gas policy was not a high priority issue in either state.

Table 4.1 Oil and Gas on the Legislative Agenda in New York and Pennsylvania, 1995-2016

	New York		Pennsylvania	
	1995-2008	2009-2016	1995-2008	2009-2016
<i>Legislative Interest</i>				
Average proposals per session	6.86	49	4	62.75
Average primary sponsors per session	4.71	21.25	4.3	36.75
Total legislative sessions	7	4	7	4
<i>Proposed bills and resolutions</i>				
	%	%	%	%
Economic development	50.00	9.69	64.29	9.56
Environmental regulation	29.17	67.86	7.14	46.22
State revenue	2.08	3.06	0.00	21.12
Lessor & landowner rights	16.67	18.88	28.57	20.72
Other	2.08	0.51	0.00	2.39
Total legislative proposals	48	196	28	251

Legislative hearings indicate that, prior to 2009, oil and gas policy attracted more attention in New York than in Pennsylvania because New York lawmakers took greater notice of the 2000s boom in conventional drilling. Between 1995 and 2008, two hearings on gas drilling were held by the New York State General Assembly’s Environmental Conservation Committee, and one hearing was held by the Pennsylvania House of Representatives’ Environmental Conservation and Energy Committee.<sup>25</sup> In New York, the first hearing was sparked by drilling within the Trenton Black-River (TBR) formation. On November 16, 2004, the New York House environmental committee held

<sup>25</sup> Henceforth, I refer to the New York State General Assembly’s Environmental Conservation Committee and the Pennsylvania House of Representatives’ Environmental Conservation and Energy Committee as “House environmental committees.”

a hearing on the TBR in Elmira, which was uneventful and largely supportive of gas drilling. It wasn't until the political controversy over fracking emerged that some New York lawmakers became opposed to gas drilling. In 2008, House environmental committees in New York and Pennsylvania held hearings to learn about the shale gas boom. At these hearings, the testimony of EAOs foreshadowed state differences that would contribute to shale policy divergence. EAO testimony in New York was significantly more critical of shale drilling than in Pennsylvania. However, in 2008, legislative hearings did not provide evidence of significant challenges to the policy status quo in either state.

Following the Marcellus Shale gas boom, legislative attention to oil and gas policy increased dramatically in New York and Pennsylvania. Between 2009 and 2016, New York legislators introduced an average of 49 oil and gas bills and resolutions per legislative session for a total of 196 legislative proposals. In Pennsylvania, lawmakers introduced on average almost 63 bills and resolutions per legislative session for a total of 251 legislative proposals. The shale gas boom not only led to more legislative proposals, it also led more lawmakers to sponsor legislation. I use the average number of primary sponsors per legislative session as a proxy measure of lawmaker interest in oil and gas policy. Prior to 2009, there 4.7 average primary sponsors per legislative session in New York, and 4.3 in Pennsylvania. After the shale gas boom, this figure increased substantially in both states. However, significantly more lawmakers became primary sponsors in Pennsylvania than New York. Between 2009 and 2016, the average number of primary sponsors per legislative session was 23.3 in New York, and 36.8 in Pennsylvania.

The content of legislative proposals reveals that, following the shale gas boom, not only were more Pennsylvania lawmakers active in proposing legislation, but that these lawmakers were significantly more supportive of the oil and gas industry than New York legislators. This is seen not so much in broad categories of oil and gas proposals displayed in Table 4.1, but in the content of a subset of proposals that dealt specifically with the environmental regulation of oil and gas drilling. I illustrate how the shale gas boom reshaped legislative agendas for oil and gas policy in these states by first describing broad changes in the subtopics of proposals, and then, examining qualitative differences in proposed environmental regulation.

Proposed bills and resolutions on the subject of oil and gas drilling were categorized in terms of the following subtopics: economic development, environmental regulation, state revenue, landowner and lessor rights, and other. Economic development bills sought to remove regulatory and tax burdens, or otherwise promote the oil and gas industry. Environmental regulation bills sought to reduce the adverse environmental impacts or address the public health and safety risks of oil and gas drilling. State revenue bills sought to increase taxes or fees on the oil and gas industry. Landowner and lessor rights bills sought minimum royalties and production meters for wells, increased information and extended termination periods for leases, or greater protections for surface owners and those subject to compulsory pooling. Bills coded “other” dealt with various miscellaneous topics.

Table 4.1 shows similarities and differences in how New York and Pennsylvania legislators responded to the shale gas boom. After 2009, attention to the economic development of oil and gas declined relative to other subtopics in both New York and

Pennsylvania. Between 1995 and 2008, 50% of New York's oil and gas bills, and 64% of Pennsylvania's bills focused on economic development. Between 2009 and 2016, these figures fell to just over 9% in both states. In Pennsylvania, relative attention to lessor and landowner rights also decreased between the two legislative periods, from 28.6% to 20.7%. In New York, relative attention to lessor and landowner rights increased slightly from 16.7% to 18.9%. After the shale gas boom, New York lawmakers primarily shifted their focus towards environmental regulation. Between 1995 and 2008, 29% of the oil and gas bills proposed in New York sought to increase environmental regulations for the industry. Between 2009 and 2016, this figure had risen to 67.9%. Legislative attention to environmental regulation also increased in Pennsylvania. Between 1995 and 2008, only 7% of Pennsylvania's oil and gas bills focused on environmental regulation. This figure grew to 46% during the 2009-2016 legislative period. In Pennsylvania, the legislative agenda also included a new subtopic (state revenue) that was practically absent in New York. 21% of Pennsylvania bills in the 2009-2016 legislative period sought to increase taxes or fees on the industry, while less than 1% of New York bills did so during this period.

The fact that state revenue became an important topic of proposed oil and gas legislation in Pennsylvania, but not in New York, reveals a significant difference in how lawmakers in these states viewed the shale gas boom. Notably, neither New York nor Pennsylvania imposed a severance tax on oil and gas production (Kent et al. 2011). Severance taxes are intended to capture the externalities of resource extraction, and provide monetary compensation for resource loss. Operators pay a tax on either the value or volume of oil and gas produced from a well, a cost that is incurred for the life of a

well. In Pennsylvania, the debate over whether or not to impose a severance tax was a major focus of shale policy discourse, and is discussed further in the following sections. For now, the fact that the severance tax issue was entirely absent from New York's legislative agenda suggests the economic incentives did not significantly shape the political calculus of New York lawmakers with regards to shale gas drilling.

While broad categories of proposed oil and gas legislation provide some insight to shale policy dynamics, a detailed consideration of proposed environmental regulations is much more revealing. Table 4.2 displays the subtopics of proposed environmental regulations for oil and gas development introduced in New York and Pennsylvania between 2009 and 2016. The sheer number of subtopics reveals the complexity of oil and gas policy, particularly since even these categories significantly reduce the content of legislative proposals. Nevertheless, Table 4.2 provides a convenient overview of the major themes of proposed oil and gas regulations in these states.

Focusing on the most frequent subtopics for each state shows some significant differences in how New York and Pennsylvania lawmakers approached the environmental regulation of shale gas drilling. In New York, almost 20% of environmental proposals sought a moratorium or total ban on unconventional drilling or fracking. By contrast, only 3% of environmental proposals in Pennsylvania did so. The most frequent subtopic in Pennsylvania was increased regulation. This subtopic included proposals that addressed very specific aspects of oil and gas drilling (e.g., unconventional well spacing, compressor stations, and construction standards for well pads), as well as, omnibus legislation that proposed a wide range of revisions to existing oil and gas law. In Pennsylvania, almost 26% of environmental proposals sought increased regulation. In

New York, this was the third most frequent topic comprising 13.5% of environmental proposals.

A qualitative review of “increased regulation” proposals further reveals that Pennsylvania lawmakers took a much more favorable stance towards shale gas drilling than lawmakers in New York. A number of omnibus proposals in New York included provisions that would have banned drilling within the New York City watershed, and certain portions of the Delaware River watershed, as well as, fracking chemical disclosure requirements that did not make exceptions for trade secrets. Pennsylvania proposals for “increased regulation” did not include such stringent standards. Notably in Pennsylvania, all but one of the environmental proposals that sought the disclosure of fracking chemicals made exceptions for trade secrets. Such exemptions were widely criticized by environmentalists as leading to fracking chemical disclosure requirements that were largely symbolic. Finally, a more stringent regulatory stance in New York is revealed by the significant percentage of environmental proposals that sought certain prohibitions regarding oil and gas waste (15.8%). Most of these proposals banned waste treatment facilities in New York from accepting any oil and gas waste, although some proposals only banned oil and gas waste that came from out of state. While a few environmental proposals in Pennsylvania sought increased regulation of oil and gas waste treatment, none sought a similar ban.

Table 4.2 Subtopics of Legislative Proposals for the Environmental Regulation of Oil and Gas Development, 2009-2016

	New York %	Pennsylvania %
Increased regulations (omnibus and specific)	13.53	25.90
Moratorium or ban on UOGD	19.55	3.01
Increased regulations (water supply protection)	9.77	4.82
Certain prohibitions regarding oil and gas waste	15.79	0.00
Increased regulation of waste management	9.77	3.61
Funds and fees	6.77	3.61
Fracking fluid disclosure	0.00	7.23
Public participation and information	1.50	5.42
Workplace safety and whistleblower protections	3.01	4.22
Increase industry liability	6.02	0.00
Moratorium or ban on state forest land	0.75	3.61
Health advisory panel, registry and/or research (UOGD)	0.00	3.01
Increased regulation on state forest land	3.76	0.00
Mineral rights on state lands revert to state	3.76	0.00
Prohibit in sensitive areas	2.26	0.00
Resolutions for federal fracking regulation	0.00	1.81
Other	3.76	3.61
Total	133	116

In New York and Pennsylvania, the shale gas boom sparked increased legislative attention to the environmental risks of unconventional gas drilling and fracking. Yet, lawmakers in these states took different approaches when crafting legislative proposals to address these risks. In Pennsylvania, legislators maintained the policy status quo by adopting a regulatory approach that was more or less favorable towards the gas industry. The shale policies that Pennsylvania enacted are discussed in a later section, and provide further evidence of this. Legislators in New York were more apprehensive about the



environmental risks of shale drilling and fracking, and proposed more stringent regulations. The analysis of legislative attention in this section provides some evidence that historical differences in natural resource extraction may account for these differences. Following the shale gas boom, the average number of primary sponsors per legislative session was higher in Pennsylvania than in New York, indicating that more lawmakers in Pennsylvania had an interest in oil and gas policy. In Pennsylvania, “state revenue” also emerged as an important topic of oil and gas policy, one that was largely absent in New York. This suggests that the perception of economic incentives surrounding oil and gas development shaped the policy frames of lawmakers in Pennsylvania more so than in New York.

These findings are consistent with the idea that different histories of natural resource extraction contributed to shale policy divergence by influencing the political calculus of policymakers. An analysis of legislative hearings on the Marcellus Shale gas boom provides further evidence to support this claim, and the broader argument that shale policy development in New York and Pennsylvania was path dependent. The controversy over fracking disrupted the policy status quo in New York, and led new interests to challenge the industry’s dominance over oil and gas policy. In New York and Pennsylvania, distinct histories of resource extraction and urban influence led to very different interest group dynamics, which significantly contributed to shale policy divergence. Participation in legislative hearings, which were held on the Marcellus Shale gas boom in each state, illustrate these differences and are examined in the next section.

## INTEREST MOBILIZATION: LEGISLATIVE HEARINGS ON THE MARCELLUS SHALE

In 2008, unconventional drilling expanded rapidly throughout Pennsylvania, and gas companies began to seek unconventional well permits within the New York Marcellus Shale. At this time, news reports also began to highlight drilling within the Marcellus Shale, which was predicted (correctly) to become one of the most productive shale gas reservoirs in the United States. These events led lawmakers and other policy actors to pay attention to the shale gas boom, and spurred a series of legislative hearings in New York and Pennsylvania. I use testimony at these hearings to describe interest mobilization on shale policy issues. In particular, I consider differences in the frequency of testimony and policy frames of EAOs in these states. Whereas environmental interests were strongly represented at New York's legislative hearings, in Pennsylvania, fewer environmental interests testified, and those that did offered weak challenges to the oil and gas industry. Distinct histories of resource extraction and urban influence in these states help explain these differences. This section places interest mobilization in historical and political context, and further illustrates the path dependence of shale policy development in New York and Pennsylvania.

Legislative hearings may be held for a variety of reasons. Most directly, they provide lawmakers with information about policy issues and the potential consequences of policy change. Legislative hearings are also an important institutional venue where public frame contestation occurs. Thus, they offer lawmakers information about the electoral consequences of policy decisions, and contribute towards the legitimization of policy issues and agendas (Burstein and Hirsh 2007; Johnson 2008; Pettinicchio 2012). In

New York and Pennsylvania, legislative hearings on the Marcellus Shale served both functions. They were explicitly intended to provide lawmakers with an opportunity to learn about shale gas drilling and associated policy issues. To this end, policy experts, primarily from the oil and gas industry and state regulatory agencies, were invited to give presentations. This “expert” testimony often served to legitimize a policy status quo supportive of shale gas drilling. EAOs and other environmental interests also participated in legislative hearings, typically by requesting the opportunity. EAO testimony offered a potential challenge to the policy status quo. I compare the interests and policy frames observed at legislative hearings held in New York and Pennsylvania, and provide some political and historical perspective to the patterns observed in each state.

Table 4.3 presents House hearings held on the Marcellus Shale between 2008 and 2013 for each state by legislative committee.<sup>26</sup> The New York House Environmental Committee held five hearings on the Marcellus Shale. All of these hearings were held to solicit input on the environmental impacts of shale drilling, and were inspired by the NYSDEC’s SGEIS on fracking. In Pennsylvania, legislative hearings on the the Marcellus Shale were sponsored by multiple committees, and covered a wider range of policy issues. In all, Pennsylvania House committees held ten hearings. The first occurred in 2008, and the last occurred in 2010. The Pennsylvania House Environmental Committee held five hearings to understand the mechanisms involved in shale gas drilling, the potential environmental concerns associated with the process, and to discuss potential regulations. A potential severance tax or impact fee on natural gas production was the subject of four hearings by the Pennsylvania House Finance Committee, and one

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<sup>26</sup> As of 2016, the last House hearing to be held in either state on the Marcellus Shale, or oil and gas development generally, occurred in 2013 in New York.

hearing by the Pennsylvania House Appropriations Committee. Finally, the Pennsylvania Labor Relations Committee held a hearing on workplace safety, a qualified workforce, and environmental concerns related to the Marcellus Shale.

Table 4.3 Legislative Hearings on the Marcellus Shale, 2008-2013

	New York <sup>a</sup>	Pennsylvania <sup>b</sup>
<i>House hearings by committee</i>		
Environmental	5	5
Appropriations	0	1
Finance	0	4
Labor Relations	0	1
<b>Total</b>	<b>5</b>	<b>11</b>

<sup>a</sup>One hearing was held in 2008, one in 2009, two in 2011, and one in 2013.

<sup>b</sup>One hearing was held in 2008, three in 2009, and seven in 2010.  
See Appendix B for more detail.

Differences in the frequency and topics of legislative hearings in New York and Pennsylvania reflect the fact that shale policy development in these states occurred through different governmental processes and focused on different policy problems. In New York, the environmental risks of shale drilling, and a possible fracking ban were the key policy issues, and shale policy development primarily occurred through the executive branch. A final decision on fracking would be made by the NYSDEC and the governor through the SGEIS process. New York House hearings contributed to this process by providing a forum for policy debate. However, there was little incentive for the New York State Legislature to take up other shale policy issues until after completion of the SGEIS.

In Pennsylvania, shale policy development occurred through a more traditional legislative process. Legislative hearings in this state provided lawmakers opportunities to learn about shale policy issues, and to consider the details of specific legislative proposals. Shale policy development in Pennsylvania occurred amidst a major drilling boom. For Pennsylvania lawmakers, it was not a question of whether or not shale gas drilling would occur, but rather, how to manage numerous issues that the Marcellus Shale gas boom raised. Yet, the fact that the Pennsylvania House held six hearings on economic issues (e.g., a proposed natural gas severance tax or “impact fee” and workforce development), and five on environmental issues shows that capturing the economic benefits of shale drilling was a major priority of lawmakers. Indeed, hearing testimony reviewed later in this section indicates that economic considerations often trumped concerns over environmental risk.

Given the distinct character of House hearings in New York and Pennsylvania, differences in interest mobilization at these hearings are to be expected. Nevertheless, those observed are quite dramatic. I use frequency of testimony as a measure of interest mobilization at hearings. Overall, there was significantly more interest mobilization at House hearings in New York than in Pennsylvania. In particular, mobilization by environmental interests was much greater in New York. By contrast, interest mobilization by legislators, local government officials, and labor unions was greater in Pennsylvania. I describe these differences, and then, place them within political and historical context.

Table 4.4 displays testimony by interests represented for all hearings by state. Although about half as many legislative hearings were held in New York as in Pennsylvania, the frequency of testimony was higher in New York (228 to 201,

respectively). Most strikingly, the environmental interests in New York were more than three times as likely to testify as environmental interests in Pennsylvania. Whereas environmental interests provided 42.11% of testimony at five New York House hearings, environmental interests only provided 14.43% of testimony at eleven Pennsylvania House hearings. There was also significantly more testimony by research and academic experts in New York than in Pennsylvania. At New York House hearings, research and academic experts provided 8.33% of testimony compared to only 1.49% in Pennsylvania. Lawmakers, labor unions, and local or county government officials provided a higher percentage of testimony in Pennsylvania than in New York. Lawmakers provided almost 48% of testimony in Pennsylvania, and 23.7% of testimony in New York. Local or county government officials provided almost 10% of testimony in Pennsylvania compared to almost 5% in New York. Finally, labor unions provided almost 6% of testimony in Pennsylvania, while the interests of labor were not represented at any of the hearings in New York.

Table 4.4 Testimony by Interest Categories at Legislative Hearings on the Marcellus Shale, 2008-2013

	New York	Pennsylvania
<i>Interests Represented<sup>a</sup></i>	%	%
Legislature elected members	23.68	47.76
Federal & inter-state agencies	2.63	1.49
State agencies	4.82	4.98
Local/county government	4.82	9.95
Oil & gas interests	6.58	8.46
Environmental interests	42.11	14.43
Landowner interests	1.32	1.00
Other business associations	3.07	0.00
Professional & gov't associations	2.63	4.48
Research & academic experts	8.33	1.49
Labor unions	0.00	5.97
Total	228	201
	5	11
<i>Total hearings</i>		

<sup>a</sup> Each organization represented by an individual counted as a separate case.

These differences are consistent with previous analyses contained in this chapter, as well as, the analysis of anti-fracking mobilization provided in Chapter Three. Legislative hearings in New York provide further evidence that the shale gas boom disrupted a policy status quo supportive of oil and gas development, and caused lawmakers to reweigh the economic benefits of shale gas against its environmental risks. Significant mobilization by environmental interests at legislative hearings further illustrates the size and strength of New York's anti-fracking movement described in Chapter Three. It also provides additional insight into the success of this movement. New York activists recognized that legislative hearings are an important venue where public frame contestation takes place, and took advantage of opportunities to publically shape policy images and influence political agendas.

Legislative hearings in Pennsylvania reflect the continued dominance of the policy status quo. While the environmental risks of shale drilling received some attention, lawmakers were equally, if not more, interested in the economic benefits of the shale gas boom. Chapter Three highlighted the relatively small size of Pennsylvania's anti-fracking movement. Therefore, it is not entirely surprising to observe limited mobilization by environmental interests at Pennsylvania hearings. Nevertheless, the contrast between New York and Pennsylvania is striking and points to more fundamental differences between these states' environmental advocacy communities. Hearing testimony indicates that professional EAOs in New York were either much more willing or more capable of challenging the policy status quo than professional EAOs in Pennsylvania. I briefly compare the hearing testimony of professional EAOs in New York and Pennsylvania, and place state differences in historical and political context.

#### *Hearing Testimony by Key Environmental Actors*

I compare hearing testimony by key EAOs in New York and Pennsylvania for hearings held in 2009. This is the only year after 2008 in which both states held hearings. 2009 hearings also provide insight into how professional EAO framed shale policy issues before anti-fracking mobilization became widespread in 2010. Testimony by national and state-based EAOs at the 2009 hearings shows that environmental advocates in New York provided stronger challenges to the policy status quo than advocates in Pennsylvania. Whereas the policy frames of New York EAOs focused only on the environmental risks of shale drilling, those of Pennsylvania EAOs balanced the risks of drilling with the



economic benefits of natural gas production. Furthermore, Pennsylvania EAOs adopted a “clean energy” frame promoted by the oil and gas industry that portrayed natural gas as having significant environmental benefits. I argue that these differences reflect historical and political differences in these states.

In New York, the policy frames of key EAOs were consistent with a historical pattern of limited resource extraction and urban influence. Professional EAOs in New York were unfamiliar with, and therefore more apprehensive of, natural resource extraction. They also had longstanding interests in preserving the environmental quality of rural areas in Upstate New York, particularly areas within New York City’s watershed. The policy frames of environmental advocates in Pennsylvania were informed by the state’s history of fossil fuel extraction. Pennsylvania EAOs had long operated in a political environment dominated by energy interests. In Pennsylvania, the political and environmental legacy of coal mining provided the backdrop for shale policy debates. Historically, professional EAOs in Pennsylvania tended to follow the path of least resistance. Accepting the policy status quo gave EAOs a seat at the table, which traditionally they had used to lobby for the funding of land preservation programs and the remediation of pollution from abandoned coal mines. In New York and Pennsylvania, the way that “insider” EAOs approached shale policy issues followed pre-existing patterns set forth by distinct extractive and environmental histories.

The New York House Environmental Committee held one hearing in 2009 at which the Natural Resources Defense Council (NRDC), the Atlantic Chapter of the Sierra Club, and the Environmental Advocates of New York each provided testimony. All three of these EAOs had testified at the first legislative hearing on the Marcellus Shale held in

New York in 2008. These EAOs are notable for their size and influence. In particular, the NRDC is what Bosso (2005) calls a “keystone” organization of the environmental movement. While none of these groups called for an outright ban, they all supported a continued moratorium until an adequate SGEIS could be completed. Representatives of each of these organizations criticized the draft SGEIS that the NYSDEC had released in September of 2009, and called for expansions. For example, the Atlantic Chapter of the Sierra Club called for a study of cumulative impacts of drilling, and additional examination of wastewater disposal, and air emissions. The NRDC stated the need for stronger regulations, better staffing of the NYSDEC, and further limits on drilling within watersheds. Similarly, Environmental Advocates of New York highlighted water contamination issues and the importance of watershed protection. None of the representatives for these organizations acknowledged the benefits of shale gas drilling, but rather, focused their testimony on the problematic aspects of the industry.

By contrast, environmental advocates testifying at Pennsylvania’s hearings in 2009 explicitly recognized the benefits of the Marcellus Shale gas boom. Of the three hearings held in 2009, only two were attended by environmental interests. All three of the environmental actors to attend hearings were state-based organizations. PennFuture (i.e., Citizens for Pennsylvania’s Future) attended the Environmental Resources and Energy Committee hearing held on March 31, 2009, and the Sierra Club of Pennsylvania, and the Pennsylvania Lands Trust attended the Appropriations Committee’s hearing about a proposed severance tax on April 3, 2009. In particular, the testimony of PennFuture suggests that environmental interests with access to the policy process were more or less

aligned with the policy status quo.<sup>27</sup> In the words of PennFuture's President and CEO, Jan Jarrett,

"PennFuture, like everybody else in this room, has been really excited watching the development of the Marcellus Shale gas formation. It poses a great potential to benefit Pennsylvania's economy, particularly the economy in our rural areas. But gas drilling, just like all forms of energy production, poses risks to the environment."

Jarrett went on to describe some potential risks of shale drilling, for example, the disposal of wastewater and cumulative impacts on forested areas, and ways to mitigate these impacts. Nevertheless, her testimony was generally supportive of drilling. She highlighted the benefits of natural gas as a bridge fuel, and urged the legislator to consider a severance tax, which could provide more funds for environmental conservation in the state.

The testimony of the Pennsylvania Sierra Club and the Pennsylvania Lands Trust contained similar themes. While both acknowledged the negative impacts of drilling, these were presented as known and manageable risks that could be addressed with increased staffing at the PADEP and revisions to existing environmental regulations. Both organizations highlighted the benefits of a severance tax, and emphasized that a portion of such a tax should be used to fund environmental stewardship in the state. The Pennsylvania Sierra Club also noted the benefits of natural gas as a bridge fuel. Overall,

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<sup>27</sup> PennFuture was founded in 1998 by John Hanger who served as president of the organization until being appointed Secretary of the PADEP in 2008 by Governor Ed Rendell.

it seemed that “insider” EAOs in Pennsylvania presented, at best, weak challenges to the policy status quo.

The shale policy frames of professional EAOs in New York and Pennsylvania evolved out of previous patterns of environmental advocacy, and thus were, to some extent, path dependent. Because fracking was viewed as a threat to New York City’s water supply, professional EAOs in New York had strong motivation to challenge the policy status quo. The environmental advocacy community in Pennsylvania was more accustomed to fossil fuel extraction, and industry dominance over policy debates. As a result, key EAOs in Pennsylvania were less interested in challenging pre-existing policy settlements, which prioritized the economic benefits of resource extraction, and more concerned with ensuring a revenue stream to support environmental conservation efforts. Key EAO policy frames, and more generally, the mobilization of environmental interests at legislative hearings are emblematic of broader movement trajectories in New York and Pennsylvania. The New York anti-fracking movement leveraged popular protest against shale gas drilling and professional environmental advocacy to pressure political decision-makers to ban fracking. In Pennsylvania, the anti-fracking movement not only struggled to gain popular support, but also competed with segments of the environmental advocacy community that accepted the dominant view of shale gas drilling. Consequently, Pennsylvania’s anti-fracking movement had little political influence.

The next section describes the political dynamics surrounding key policy decisions that eventually led to shale policy divergence in New York and Pennsylvania. In doing so, I bring together multiple elements that comprise a “minimalist” account of path dependence to explain policy development in each state. New York and

Pennsylvania's policy paths were shaped by unique histories of resource extraction, urban influence, and environmental preservation, which provided distinct contexts for environmental mobilization and political decision-making. Shale policy divergence was also shaped by trends in political partisanship, and contingent events and particular strategic actions, which were not determined by states' environmental and extractive histories. By tracing shale policy development in each state, I illustrate how these factors combined to produce a fracking ban in New York, and a regulatory regime in Pennsylvania that facilitated intensive shale gas extraction.

## NEW YORK'S FRACKING BAN

In 2015, New York became the only state with significant shale energy resources to prohibit oil and gas development using high-volume hydraulic fracturing (HVHF) or fracking. New York's policy was based on the findings of an environmental review conducted by the NYSDEC (i.e., the SGEIS), which determined that fracking posed significant adverse environmental and public health impacts that, even with mitigation measures, outweighed its potential social and economic benefits. NYSDEC's final determination followed seven years of divisive policy debate, intense anti-fracking mobilization, and multiple expansions of the formal scope of the SGEIS. When Governor David Paterson ordered the SGEIS in 2008, few expected it to result in a de facto fracking ban. A string of factors came together to not only facilitate the development of a popular anti-fracking movement, but to also make policymakers more susceptible to its

political influence. I describe the political dynamics surrounding key policy decisions that led to New York's fracking ban, and discuss how the state's policy path was shaped by a combination of history, collective action, and contingent events.

Governor David Paterson ordered the NYSDEC to conduct an environmental review of fracking in July of 2008, at the same time as, he signed into law new well spacing measures intended to facilitate the development of the Marcellus Shale. Governor Paterson's decision was informed by growing public concern, environmental advocacy, and the suggestions of his environmental advisors. As the well spacing measures came up for a vote, Governor Paterson was already facing pressure from professional EAOs, including the NRDC, the Sierra Club-Atlantic Chapter, and Catskill Mountainkeeper, to veto the legislation. One issue that these EAOs highlighted was that New York's oil and gas regulations were severely out of date. At the time, New York's oil and gas regulatory program was based upon an initial GEIS, which had not been updated since its adoption in 1992. This combined with growing local opposition to drilling helped convince Governor Paterson to take a more precautionary approach to fracking.

The Marcellus Shale gas boom led to prospective drilling in areas of New York that were not familiar with oil and gas development. Early in 2008, gas leasing within New York's Southern Tier caught the attention of grassroots activists and professional EAOs who began to raise awareness about the potential risks of shale gas drilling and fracking. In July 2008, growing public concerns about these risks were evident at two gas drilling forums held by the New York Farm Bureau (NYFB) and the NYSDEC in Broome County and Chenango County. Unlike "landowner rights" workshops, which the NYFB and Cornell Cooperative Extension had been sponsoring, these forums were

intended to provide the public with information about how the NYSDEC would manage the impacts from shale gas development. They had been arranged by Assemblywoman Donna Lupardo, who sat on the House Environmental Committee, after her office received numerous complaints from concerned constituents that summer. According to Wilber (2012), the intensity of public concern expressed at both meetings led NYSDEC officials and Governor Paterson's environmental advisors to propose that the governor enact the new spacing rules while revising oil and gas regulations through a SGEIS.

This decision provided movement organizers with an important opportunity to educate and mobilize the public around the issue of fracking. Chapter Three described how the SGEIS provided the New York anti-fracking movement with a clear institutional target, and helped unify activists around the goal of a statewide fracking ban. Over the next seven years, the SGEIS process would be a central focus of grassroots and professional movement organizers who mounted a coordinated campaign to increase participation in the public comment process. These efforts not only had direct political influence, but also contributed to movement expansion by providing citizens with an educational opportunity and a pathway to activism. In New York, a synergy developed between grassroots mobilization and professional advocacy that led to an anti-fracking movement, which was popular, organized, and well-resourced. The ability of this movement to inspire local campaigns, mass protest, and overwhelming public participation in the SGEIS process was the single most important factor leading to New York's fracking ban.

It would take seven long years of committed activism to achieve this outcome. Two important steps along the way were: 1) Governor Paterson's 2010 executive order

requiring the NYSDEC to complete a revised and expanded SGEIS, and re-open the draft to public comment, and 2) Governor Andrew Cuomo's 2012 decision to have the NYSDEC request that the New York State Department of Health (NYSDOH) review and assess the Department's analysis of potential health impacts contained in the revised Draft SGEIS. These decisions followed continual demands from activists and environmental advocates that the NYSDEC and the governor expand the scope of the SGEIS. By placing persistent pressure on political decision-makers, New York's anti-fracking movement was able to shift the dominant policy discourse surrounding shale gas development from economic opportunity to environmental risk.

While mass mobilization was key to overturning the policy status quo in New York, activists also encountered a very favorable political opportunity structure. Democratic Party control of New York's Executive Branch and State Assembly increased the movement's chances of finding political allies, as did the unique threats that fracking posed to New York City's water supply. New York City has significant direct and indirect influence on New York State politics. In 2009, New York City had 65 out of 150 seats in the New York State Assembly, or 43% of the total (Berg 2012). This figure is about equal to the city's percentage of the state population. In this year, all but 2 of New York City's representatives were Democrats. Similarly, in the New York State Senate, the city had 25 out of 62 seats in 2009, or 40% of the total (Berg 2012). In this year, 22 out of 25 senators from the city were Democrats. The city's sizable representation in the state legislature gave it significant influence over shale policy at the state level. Finally, the fact that oil and gas drilling was historically quite limited in New York meant that most lawmakers did not have strong pre-existing commitments to extractive industries. I



consider how this unique set of political opportunities contributed to the 2010 order for a Revised SGEIS, the 2012 order for a public health review by the NYSDOH, and the 2015 decision to ban fracking.

In September 2009, the NYSDEC released the draft SGEIS for public review. The NYSDEC held four hearings, and received over 13,000 written and verbal comments on the draft SGEIS (NYSDEC 2015). In addition, it received comments from transcripts of hearings held by the New York State Assembly, the City of Oneonta, and the Tompkins County Council of Governments (NYSDEC 2015). The initial draft SGEIS proposed supplementary permit conditions for HVHF wells, which would have modernized New York's oil and gas regulations. While some proposed measures were somewhat more stringent than those of other states, the draft SGEIS more or less brought New York's regulations in line with common practices (Richardson et al. 2013).

Environmentalists mounted severe criticisms of the draft SGEIS. In particular, they argued that the scope of the review was too narrow and did not adequately address the risks of contamination to groundwater and surface drinking water, cumulative environmental impacts, threats to community character, or public health risks. Environmental advocates argued for a more comprehensive analysis of the risks of fracking. Notably, they were able to leverage support within the New York State Legislature to pressure Governor Paterson to extend the SGEIS process. In the summer of 2010, Assemblyman Robert Sweeney, who served as the Majority Chair of the New York State Assembly's Environmental Conservation Committee, and represented a district on Long Island, introduced legislation calling for a one year moratorium on fracking. Dubbed the "mini-moratorium bill" by environmentalists, this legislation was passed by

both chambers and delivered to the governor on December 1, 2010. On December 13, 2010, Governor Paterson vetoed the mini-moratorium bill, and issued Executive Order 41, which directed the NYSDEC to complete a revised draft SGEIS, and provide for additional public comment.

Governor Paterson's executive order was heralded as a major success by activists. Not only did it extend the SGEIS process, it also stated that the revised SGEIS should "ensure that all environmental and public health impacts [of HVHF] are mitigated or avoided" (Paterson 2010:1). Environmental advocates immediately jumped on this opportunity to pressure the NYSDEC to expand the scope of the review (Hang 2010). On September 7, 2011, a revised draft SGEIS was released for public comment, which was significantly enlarged. The revised draft SGEIS addressed impacts to water resources, ecosystems and wildlife, air resources, greenhouse gas emissions, socioeconomic conditions, community character, seismicity, and transportation systems. It also included a discussion of NORM (naturally occurring radioactive materials) associated with drilling waste.

In October 2011, the NYSDEC also released proposed draft regulations to be considered as part of a comprehensive regulatory program detailed in the revised draft SGEIS. During the fall of 2011, the NYSDEC held hearings and accepted public comment on the SGEIS and proposed regulations. The NYSDEC received 67,000 comments on the revised draft SGEIS, and 180,000 on the draft regulations (NYSDEC 2015). These comments were overwhelmingly opposed to fracking in New York State. In criticizing the revised draft SGEIS, environmentalists focused on NYSDEC's failure to address the public health impacts of fracking.

Movement organizers strategically focused on public health risks and put significant effort into mobilizing the medical community. This strategy was very successful and helped to bolster the legitimacy of the anti-fracking movement among policymakers. An organizer with Catskill Mountainkeeper whom I interviewed described the public health campaign in this way:

“We had a whole push to get the medical community involved. So, we got a letter that was going to be sent to Dr. Shaw [the Commissioner of NYSDOH] to talk about the health impacts, and when a doctor read the letter, and looked at the issue, they were horrified. Actually, the first SGEIS that came out there were a few, a handful of doctors were aware, and came and testified. Then, they were hooked and became activists because they were horrified that there were basically no protections for health in those proposed regulations. That’s turned into American Academy of Pediatrics, the American Medical Society for the State of New York, the New York State Nurses Association are all saying that the regulations as last drafted are not adequate, which that’s pretty. Once, one of our campaign slogans was “do what the doctor says.”<sup>28</sup>

Support from the medical community helped the New York anti-fracking movement pressure Democratic Governor Andrew Cuomo, who took office in 2011, to expand the SGEIS yet again to include consideration of public health impacts. The movement also benefited from the support within the legislature. For example, the New

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<sup>28</sup> Personal interview on November 18, 2013 in Callicoon, NY.

York State Assembly's Environmental Conservation Committee, under the direction of Majority Chair Sweeney, held two hearings on fracking in 2011. One of these addressed the revised draft SGEIS, and one focused specifically on the health impacts of fracking. An organizer from Catskill Mountainkeeper noted that, while they have not come out for a ban, some in the Assembly "have really championed the issue" and "that's created a lot of stir in Albany."<sup>29</sup> Legislators also pressured the governor by pushing for funding in the 2012 budget for a health impact assessment.

In addition, the sheer size and visibility of the New York anti-fracking movement was difficult for Governor Cuomo to ignore. Extensions of the SGEIS process gave the movement time to develop a strong organizational infrastructure and grassroots base, and foster a network of experts and community leaders to advocate against fracking. Chapter Three described how public information campaigns and the popular documentary *Gasland* contributed to anti-fracking mobilization. It also discussed how the state's unique environmental history supported coordination between major EAOs based in New York City and regional EAOs in the Delaware River watershed and other areas of Upstate New York. Importantly, organizers were able to develop and maintain strong coalitions that connected activists across the state into a cohesive movement. For example, New Yorkers Against Fracking (NYAF) was a "coalition that helped unify the national, state and grassroots organizations calling for a statewide ban, [which] ultimately [comprised] more than 250 organizations" (Weltman 2015:2). NYAF helped to amplify the voices of local anti-fracking groups, put organizers on the ground to support grassroots organizing and mobilize people for actions, promoted networks of key fracking opponents in

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<sup>29</sup> Personal interview on November 18, 2013 in Callicoon, NY.

positions of influence, and enabled collaboration and coordination of tactics and messaging (Weltman 2015).

The New York anti-fracking movement was consistently able to turn people out for mass mobilizations and smaller protests at public hearings and meetings. In particular, the movement mounted a sustained campaign to “bird dog” Governor Andrew Cuomo (Weltman 2015). An organizer from Catskill Mountainkeeper whom I interviewed noted “We’ve basically hounded the governor wherever he is.”<sup>30</sup> This pressure eventually paid off. In 2014, Governor Cuomo ordered the NYSDEC to request that the NYDOH review and assess the Department’s analysis of potential health impacts contained in the revised Draft SGEIS. In 2015, Governor Cuomo accepted the findings of the NYDOH that fracking posed significant public health risks, and ordered the NYSDEC to release the final determination of the SGEIS to ban fracking in New York State.

The New York anti-fracking movement undoubtedly was the decisive push behind Governor Cuomo’s decision to ban fracking. This movement was popular, well-resourced, and well-organized. Its organizers also skillfully navigated a political landscape that provided multiple opportunities to expand and mobilize its constituency. While this constituency spanned throughout much of Upstate New York, the fact that a significant portion resided in New York City greatly benefited the movement. Drilling within the Marcellus Shale potentially threatened New York City’s water supply system, which reached into the Catskill region and Delaware River watershed. This not only gave the movement the support of major EAOs, like the NRDC, but also led a large share of the state’s lawmakers who represented the city to be sympathetic to the cause. All of

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<sup>30</sup> Personal interview on November 18, 2013 in Callicoon, NY.

these factors must be understood against the backdrop of New York's history of limited resource extraction, which allowed for greater preservation of the state's natural resources and the development of longstanding urban interests in maintaining the environmental quality of the state's rural areas.

New York's path of environmental preservation not only provided an important context for anti-fracking mobilization, but also influenced the political calculus of policymakers. In particular, the fact that extractive industries were not well-entrenched within the state meant that lawmakers did not have strong pre-existing interests in fostering the industry's expansion. Indeed, the state's history of oil and gas development suggested that the ultimate economic impact of the industry would be small relative to the state's overall economy. Furthermore, existing and proposed pipelines connected New York to natural gas supplies in other states, namely its southern neighbor Pennsylvania. For Governor Cuomo, this meant that he could gain a major political win by banning fracking without sacrificing the economic and "clean energy" benefits of the shale gas boom. Indeed, Governor Cuomo included natural gas as a part of an aggressive clean-energy initiative to reduce greenhouse-gas emissions 40 percent below 1990 levels by 2030. While Cuomo's energy plan also makes an ambitious pledge to double the amount of electricity generated by solar, wind and other renewable sources—from the current 24 percent to 50%, he has been widely criticized by both anti-fracking activists and the energy industry for adopting such a contradictory stance towards shale gas (Lombardi 2017).

A unique combination of factors came together to support the development of a fracking ban in New York State. The core factors shaping the state's policy path were

each influenced by the state's history of limited fossil fuel extraction and urban influence. This history was, to some extent, determinative of the New York anti-fracking movement, the strength of the policy status quo, and the political calculus of New York policymakers. The nature of partisan politics also contributed to the final outcome. Increasing party polarization on environmental issues has meant that Democratic Party control is often necessary to make even minimal headway on environmental issues. The distinctiveness of New York's liberal urban elite led environmental interests in this state to benefit more than usual from a Democratic majority. In the end, these factors were brought together by contingent events and particular strategic actions. The fact that parts of New York City's watershed lay within the Marcellus Shale, that concerned citizens and movement organizers took notice of Pennsylvania's drilling boom, that these activists were skilled and committed, that preemptive mobilization led to a preemptive moratorium, these actions and events, and many others, are rightfully seen as products of agency and chance. Thus, the narrative offered here is one of minimal path dependence in which preexisting structural conditions, conjunctural conditions, and contingent events and volitional actions are together implicated in the unfolding of a particular trajectory or event cascade (Sewell 2005; Molotch, Freudenburg, Paulsen 2011; Blee 2012). The next task is to illustrate how a similar model can be applied to a very different set of historical circumstances and political dynamics in Pennsylvania.

## PENNSYLVANIA'S ACT 13

Pennsylvania's shale policies were instituted through a more traditional legislative process. In 2012, a Republican controlled government passed significant and controversial amendments to the Pennsylvania Oil and Gas Act. Act 13 of 2012 was an omnibus statute, which addressed multiple areas of oil and gas law. Notably, the legislation distinguished between conventional and unconventional wells, imposed more stringent environmental regulations on unconventional wells, and imposed a natural gas impact fee. While Act 13 reforms somewhat strengthened the environmental regulation of UOGD, it also contained loopholes and controversial provisions that restricted local authority over the zoning of oil and gas activities. Overall, Pennsylvania's shale policies were considered friendly towards the oil and gas industry (Rabe and Borick 2013). While some aspects of Act 13 are unique (e.g., the natural gas impact fee), in many ways, Pennsylvania took a regulatory approach typical of most major shale producing states.

This section describes the formulation and passage of Act 13, and considers how Pennsylvania's historical path of carbon dependence contributed to this outcome. After briefly outlining the main factors that constituted Pennsylvania's policy path, I describe how the election of Governor Tom Corbett significantly increased the political influence of the oil and gas industry. Lax regulation of shale drilling under Corbett provides an example. I discuss how industry influence over PADEP during Corbett's administration repeats a pattern observed with a former Republican governor. Next, I discuss the Marcellus Shale Advisory Commission and its role in policy formulation. Then, I consider the passage of Act 13 and its provisions. I conclude by discussing how the historical influence of fossil fuel extraction shaped the overall trajectory of shale policy



development in Pennsylvania, and assess the significance of exaggerated industry influence under Governor Corbett.

Previous analyses of the policy status quo and legislative proposals in Pennsylvania showed that lawmakers of both parties supported the expansion of the shale gas industry. This conciliatory stance towards industry was dramatically strengthened in 2011 when Republicans gained control of the legislature and executive branch. The 2011 election brought to power a governor expressly committed to the oil and gas industry. Governor Tom Corbett vocally opposed a natural gas severance tax and championed policy reforms that supported the rapid expansion of shale gas extraction. While Corbett's agenda faced some opposition from democrats, severance tax issues dominated policy debates. The small size and political marginalization of the Pennsylvania anti-fracking movement gave political decision-makers little incentive to push for significant restrictions on shale gas drilling. In the end, Pennsylvania adopted shale gas regulations that prioritized economic benefit over environmental protection, continuing its traditional accommodation of fossil fuel interests.

The election of Governor Tom Corbett substantially strengthened oil and gas industry influence in Pennsylvania. During his gubernatorial campaign, Corbett took more than \$1.8 million in contributions from the oil and gas industry, and his cabinet-level appointments strongly favored oil and gas interests (Public Accountability Initiative 2013). Most glaring was the appointment of Michael Krancer, a former attorney for the energy industry, as Secretary of Environmental Protection. Krancer's administration of the PADEP drew fire from environmentalists and the media for undue industry influence.

A consideration of PADEP's oil and gas enforcement under Krancer reveals a concerted effort by the Corbett administration to advance an industry-centric agenda.

Immediately upon taking office, Krancer sought to centralize control of oil and gas enforcement. In March 2011, he attempted to make a procedural change, which would have required field inspectors to obtain approval from department administrators prior to issuing notices of violation to oil and gas operators (Hopey 2011). After tremendous backlash from environmental groups, this policy was rescinded and disavowed. Yet several months later, a reorganization of the PADEP had a similar effect when oversight over the Oil and Gas Division was transferred from the regional offices to Harrisburg (McKelvey 2015). Indeed, enforcement rates during the Corbett administration clearly show a shift towards lax regulation. During the first three months of 2011, the PADEP's enforcement rate fell significantly compared to that of the Rendell administration. Of the 313 violations identified by field inspectors during this period, the PADEP only took 36 enforcement actions – a rate of one enforcement action for every 8.69 violations (Hopey 2011). By contrast, during the first quarter of 2010, when Governor Ed Rendell was in office, PADEP took 122 enforcement actions on 207 violations, or one enforcement action for every 1.7 violations (Hopey 2011). Although Corbett and Krancer described the reorganization of PADEP's Oil and Gas Division as an effort to bring greater uniformity to enforcement activities, these figures indicate that the change also sought to reduce the authority of oil and gas inspectors, and by extension, loosen regulation of the oil and gas industry.

Lax environmental regulation by the Corbett administration revived a Pennsylvania tradition of exaggerated industry influence under previous Republican

administrations. During the 1980s, Republican Governor Dick Thornburgh's administration was the subject of a House investigation into allegations that political priorities improperly interfered with environmental regulation. The resulting report documented unprecedented interjection of economic considerations into the decisions of environmental officials and a 30 to 50 percent drop in enforcement actions for air and water pollution violations over a period of five years (Gilliand 2011). This example is relevant because it shows that industry influence under Corbett conforms to a historical pattern in which partisan differences amplified the general tendency among Pennsylvania policymakers to prioritize economic benefits over environmental protection. As discussed in earlier sections of this chapter, democratic Governor Ed Rendell was also criticized for facilitating the expansion of the shale gas industry at the expense of environmental conservation. Yet, Governor Rendell was willing to challenge the industry on the subject of a natural gas severance tax, which he unsuccessfully sought to impose towards the end of his final term. By contrast, Governor Corbett's aggressive support of shale gas development was more reminiscent of a time when King Coal ruled the state.

The Marcellus Shale gas boom would become the defining issue of the Corbett administration. Governor Corbett entered office at a time when the regulation of shale drilling was a highly salient issue. In an effort to shape long-term policy for the state, the governor formed the Marcellus Shale Advisory Commission in March 2011, which was tasked with developing policy recommendations to be considered as part of prospective reforms to existing oil and gas law. The 30-member commission was heavily influenced by the oil and gas industry. Energy interests comprised one third of the commission with ten members, while only four environmental organizations were represented (Governor's

Marcellus Shale Advisory Commission 2011). The remaining members represented business interests, local governments, and various state agencies.

In just four months, the commission submitted its report, which contained nearly one hundred recommendations that addressed a wide range of shale policy issues. Rabe and Borick note that “the report was clearly intended to maximize the near-term development of Pennsylvania’s shale gas resources” (2013: 328). It included very detailed recommendations (e.g., setback distances, well bond amounts), and became the basis of “the Corbett Plan,” the governor’s legislative proposal to reform Pennsylvania’s Oil and Gas Act. Many aspects of this plan survived the legislative process. Despite substantial opposition, a Republican controlled legislature passed Act 13 in 2012 with a vote that largely followed partisan lines.

There were five general aspects to the Act 13 reforms: an unconventional gas well fee, an oil and gas lease fund, a natural gas development program, classification and regulation of development, and local ordinances relating to oil and gas development. While some provisions did not pertain to environmental regulation, the majority of the statute addressed this topic in some way. The unconventional gas well fee and oil and gas lease fund provided increased resources for environmental regulation, the conservation of public lands, and hazardous waste remediation. Act 13 also imposed more stringent environmental regulations on unconventional wells including: increased well setbacks, well bonding and penalties for violations, additional site inspections, enhanced fracking chemical disclosure rules, increased floodplain protections, additional standards for waste containment, and an annual inventory of air emissions.

While Act 13 reforms did provide for meaningful reductions in the environmental impacts of shale gas drilling, it also contained loopholes and other questionable provisions. A consideration of some of its regulatory amendments suggests that Act 13 was somewhat of a mixed bag in terms of environmental protection. Well setbacks from public water supplies were significantly extended to 1,000 feet. However, this merely brought Pennsylvania in line with policies in place in New York since the early 1990s. Enhanced disclosure rules provided significant public access to information about fracking chemicals, but contained a loophole for trade secrets.<sup>31</sup> In addition, Act 13 constrained the authority of PADEP and its Bureau of Oil and Gas Management by mandating that the agency issue permits within 45 days unless an application is denied for one of six specific reasons. This placed the agency under considerable time pressure and limited opportunities for environmental review. On the other hand, Act 13 left open the possibility of a ban on the use of open pits for waste containment. In 2016, new regulations promulgated by PADEP prohibited open pits at unconventional well sites (Pennsylvania Department of Environmental Protection 2016b). (Notably, this major win for environmentalists occurred under democratic Governor Tom Wolf.) Nevertheless, when considered as a whole, I agree with Rabe and Borick that “it is extremely difficult to review the details of this legislation and view it as a model of state government commitment to environmental protection” (2013: 329). In particular, provisions related to the unconventional gas well fee and local ordinances tend to undercut any environmental benefits that the legislation may have had.

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<sup>31</sup> Operators submit well reports that are accessible online through the FracFocus Chemical Disclosure Registry ([fracfocus.org](http://fracfocus.org)) developed by the Groundwater Protection Council and the Interstate Oil and Gas Compact Commission.

The unconventional gas well fee and local ordinances were two of the most controversial aspects of Act 13. Further consideration of these provisions shows that Act 13 was highly favorable to the oil and gas industry. Pennsylvania is the only major oil and gas producing state that does not impose a severance tax on oil and gas production. Severance taxes are intended to capture the externalities of resource extraction, and provide monetary compensation for resource loss. Operators pay a tax on either the value or volume of oil and gas produced from a well, a cost that is incurred for the life of a well. In lieu of a severance tax, Act 13 created an unconventional gas well fee (i.e., “impact fee”). The intent of the impact fee was to provide local governments and the state compensation for negative impacts that occur during the initial construction and development of oil and gas wells. It imposes a temporary cost on producers that is confined to a 15-year period and declines over time. Significantly, Act 13 shifted the political burden of fee imposition to local governments by granting counties, and in some cases, municipalities the authority to adopt the fee. As Rabe and Borick (2013) note, this allowed state lawmakers to avoid political responsibility for imposing the fee. Nevertheless, the state retained full authority over the structure of the fee, the specification of appropriate local uses, and took a minimum 40% cut of oil and gas well funds.

The impact fee was specifically designed to prevent local governments from imposing ordinances that seek to mitigate the environmental impacts of gas drilling. Local governments that impose restrictions on drilling beyond what is already provided for by state law may lose impact fee funds for “non-compliance.”<sup>32</sup> Act 13 also prohibits

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<sup>32</sup> This provision was struck down by the Pennsylvania Supreme Court in 2013.

municipalities from challenging state regulatory decisions related to well permits. Finally, the law grants primary authority for implementation of the impact fee to the Pennsylvania Public Utility Commission (PUC), an agency “whose commissioners are gubernatorial appointees and that has never played a major role in environmental protection law enforcement” (Rabe and Borick 2013: 333). Overall, Act 13 was designed to maximize the short-term benefits of the shale gas boom, and support the rapid expansion of shale drilling in Pennsylvania. In particular, the design of the impact fee conveniently allowed state politicians to avoid responsibility for imposing costs on the industry, while at the same time, benefiting from near-immediate fiscal benefits. Furthermore, the temporary nature of the fee meant that the governor and most members of the legislature would likely be out of office by the time revenues from the first wave of drilling were exhausted (Rabe and Borick 2013).

Pennsylvania was the first state to pass comprehensive reforms to its oil and gas law to address issues associated with shale drilling. With the passage of Act 13, the state lost an opportunity to become a leader in the environmental regulation of UOGD. Although Act 13 inspired strong partisan divides, it is unclear that Democrats would have done much better had they had a majority. In previous sections, I reviewed how a policy status quo supportive of fossil fuel extraction guided early responses to the Marcellus Shale gas boom when Democrats controlled Pennsylvania’s Executive Branch and House of Representatives. I also described how, following the shale gas boom, proposed oil and gas legislation was almost as likely to focus on state revenue or landowner and lessor rights as environmental regulation. Indeed, debates over Act 13 largely centered on Corbett’s vehement opposition to a severance tax, which many Democrats supported.

While Democrats were also supportive of more stringent environmental regulations than contained in the Corbett Plan, the tenor of policy debates suggests that, regardless of which party controlled government, Pennsylvania was unlikely to place significant burdens on the shale gas industry.

The general tendency to support the expansion of shale gas development was not unique among Pennsylvania lawmakers. Within the United States, natural resource policy has historically prioritized economic benefit over environmental protection (Andrews 2006; Davis 1993). Yet, the strength of the policy status quo in Pennsylvania was similar to that found in most major energy producing states. The overall trend in shale policy discourse and shale policy outcomes is consistent with a historical pattern of carbon dependence outlined in Chapter Two. The historical influence of fossil fuel extraction in Pennsylvania, particularly coal mining, predisposed lawmakers to support extensive resource extraction. In fact, legislators and regulators employed policy frames that presented shale gas as much cleaner and more environmentally-friendly than coal, both in terms of its use and its production. Lawmakers also had little incentive to challenge the industry. Environmental mobilization at legislative hearings did not challenge the policy status quo, and anti-fracking mobilization described in Chapter Three failed to gain popular support. These factors are best understood against the backdrop of Pennsylvania's coal mining legacy. The historical influence of resource extraction led to significant policy inertia and weak environmental opposition to fracking.

Nevertheless, even for Pennsylvania standards, the oil and gas industry had remarkable political influence during the Corbett administration, as shown by the provisions of Act 13 and lax regulatory enforcement. This also followed a historical



pattern in Pennsylvania in which Republican Party control exaggerated the prioritization of economic benefit over environmental protection. However, it also reflected a general pattern of increasing political polarization on environmental issues within the United States. Since the early 1990s, the voting records of Congressional Republicans have shown increasing hostility towards environmental protection, and among the American public, support for funding for environmental protection reflects a similar partisan divide (McCright, Xiao, and Dunlap 2014).

Shale policy development in Pennsylvania followed a pattern of path dependence that more closely resembled “strong” versions often employed by institutionalist scholars. The historical influence of the fossil fuel industry was embedded within the state’s policy institutions and political culture, and structured policy networks. Thus, the idea of self-reinforcing mechanisms or a process of increasing returns is, to some extent, applicable to this case. Yet, this process was amplified by trends in political partisanship and the raw political power of the fossil fuel industry. A minimalist approach to path dependence provides a framework that does not discount the influence of “institutional lock-in” emphasized by strong path dependency theories. However, it also allows for the incorporation of other factors (e.g., partisanship and social movement dynamics) that play into the development of particular trajectories. More importantly, a minimalist approach is most suitable when the analyst seeks to compare cases with different path dependent structures. The overall goal of this analysis was to understand shale policy divergence in New York and Pennsylvania. I conclude this chapter by returning to this subject.

## CONCLUSION

This analysis has shown that historical context is centrally important for understanding shale policy divergence in New York and Pennsylvania. Shale policy development in each of these states was path dependent, and thus, so were the differences between them. In New York and Pennsylvania, distinct histories of natural resource extraction and urban influence meant that contexts of political decision-making and environmental mobilization were dramatically different. This set these states on divergent policy paths.

In both states, the policy status quo prior to the Marcellus Shale gas boom was supportive of oil and gas development. Whereas the policy status quo in New York was weak and vulnerable to challenge, in Pennsylvania, it was deeply engrained in political institutions and policy beliefs. In New York, shale drilling posed a threat to New York City's water supply. This facilitated the development of a well-resourced and politically influential anti-fracking movement. By contrast, the historical dominance of coal mining in Pennsylvania presented barriers to anti-fracking mobilization. Absent significant pressure from the environmental community, Pennsylvania policymakers had little incentive to challenge the policy status quo. In New York, a committed and skilled network of environmental activists was able to expand and maintain a popular anti-fracking movement. Significant public pressure for a fracking ban shifted the political calculus of New York policymakers, and led them to reconsider whether the economic benefits of shale drilling outweighed the significant environmental risks of fracking.

The popularity and strength of the New York anti-fracking movement was the key factor that influenced Governor Andrew Cuomo to impose a fracking ban. Yet, expansion of the movement was itself, to some extent, path dependent. The fact that natural resource extraction was historically limited within the state supported a path of environmental preservation that fostered urban elite interests in the environmental quality of rural areas Upstate. This, in turn, facilitated the emergence and expansion of the anti-fracking movement. Governor Andrew Cuomo's decision to impose a fracking ban must also be put into historical perspective. Given historically low levels of natural gas production in New York, the economic benefits that the state was likely to gain from shale drilling were minimal compared to the environmental risks. In addition, New York's access to natural gas pipelines meant that Governor Cuomo could ban fracking without jeopardizing the state's access to the fuel. Thus, in New York, a unique set of factors came together to support the imposition of a fracking ban, each of which must be understood against the backdrop of the state's history of limited fossil fuel extraction and urban influence.

Shale policy development in New York is a deviant case that is unlikely to be replicated in other states with significant shale energy resources. Shale policy development in Pennsylvania followed a more typical pattern. Pennsylvania adopted policies that supported the rapid expansion of unconventional drilling. This analysis has shown that a history of fossil fuel extraction in Pennsylvania led to significant policy inertia and weak environmental opposition to fracking. These factors alone would have likely led to relatively favorable policies for the natural gas industry. However, a Republican controlled government significantly expanded the political influence of the

industry. Pennsylvania's policy path was not only shaped by "institutional lock in", but also by the raw political power of fossil fuel interests.

The partisan dynamics surrounding Pennsylvania's Act 13 is illustrative of patterns evident in other energy dependent states such as Texas and Louisiana (Hochschild 2018; Davis 2012; Weible and Heikkila 2016). In these states, Democrats are also susceptible to cooptation by the fossil fuel industry. Yet, the political polarization of environmental issues suggests that Democratically controlled governments offer opportunities to disrupt the policy status quo that are increasingly rare under Republican control. The extreme case of New York's fracking ban entailed political dynamics that are unlikely to emerge in major energy producing states. Nevertheless, it illustrates that a the potential influence of social movements that combine mass mobilization with conventional politics.

## CHAPTER FIVE

### CONCLUSION

This study sought to understand why policymakers in New York and Pennsylvania responded to the Marcellus Shale gas boom in such dramatically different ways. As I have noted several times previously, New York took a precautionary approach to regulation that entailed a preemptive moratorium and eventual ban on fracking. Pennsylvania's policies supported the rapid expansion of shale gas development. In the preceding chapters, I argued that distinct histories of natural resource extraction and urban influence determined shale policy divergence in these states. The historical influence of extractive industries in Pennsylvania, and the absence of such industries and political influence of New York City elites in New York, set these states on divergent shale policy paths. I employed a minimalist path dependency theory to show how historical factors combined with trends in political partisanship, interest group mobilization, contingent events and particular strategic actions to produce distinct shale policy outcomes. While findings are specific to each state's policy path, they help reveal the kinds of political dynamics likely to surround shale policies in states with and without intensive resource extraction. After reviewing the key findings from each chapter, I consider the broader insights gained from this research.

State differences in natural resource extraction and urban influence provided an overall historical backdrop for understanding the sequences of events and political dynamics that led to shale policy divergence in New York and Pennsylvania. Chapter One compared these states' extractive and environmental histories. As a major coal producer, Pennsylvania had a long history of fossil fuel extraction, which strongly

influenced the state's culture, environment, and political economy. Extractive industries were not historically important in New York. However, New York City elites, who had an interest in environmental preservation, did have significant political influence. Chapter One demonstrated the existence of an environmental preservation path in New York by describing the establishment of the Adirondack and Catskill Forest Preserves, and New York City's water supply system. This chapter also described an embedded path of carbon dependence in Pennsylvania, which was illustrated by state forest management policies and an Alternative Energy Portfolio Standard that were favorable towards extractive industries. In Chapter Three and Chapter Four, I showed that each of these historical paths persisted and produced different patterns of interest mobilization and political decision-making in New York and Pennsylvania.

In particular, environmental mobilization against fracking was a key factor shaping shale policy development in New York. The New York anti-fracking movement had popular support, significant resources, and political allies. By contrast, the Pennsylvania anti-fracking movement was small and politically marginalized. Chapter Three described how distinct extractive and environmental histories led to divergent anti-fracking movement trajectories in these states. The Pennsylvania anti-fracking movement did not emerge until after the shale gas industry was already entrenched in the state. Significant support for the industry among the public and politicians limited opportunities for Pennsylvania activists who struggled to unite disparate anti-fracking groups into a statewide movement. In New York, activists mobilized preemptively against fracking, and benefited from political opportunities and an alliance of interests that supported mass mobilization. Proposed drilling within the New York Marcellus Shale not only led to

concerns among local residents, but also among New York City elites, who saw drilling as a threat to the city's water supply. This provided the New York anti-fracking movement with significant resources and political support. New York's moratorium also provided time to organize, and helped unify the movement around the goal of a fracking ban. In New York, historical circumstances combined with contingent events and strategic collective action to produce an anti-fracking movement that was relevant in state politics.

Chapter Four showed that the New York anti-fracking movement was crucial for the adoption of a fracking ban in New York. A review of initial responses to the Marcellus Shale gas boom, and proposed oil and gas legislation revealed that, prior to the political controversy over fracking, New York and Pennsylvania policymakers supported increased natural gas production. This reflected a hegemonic policy frame within the United States that has traditionally prioritized economic benefits over environmental protection. Yet, extractive industries were relatively insignificant to New York's economy. As a result, the policy status quo was much weaker in this state, and more vulnerable to challenge. In New York, environmental mobilization placed significant pressure on policymakers for a fracking ban, and a Democratic legislature heavily weighted towards New York City interests, was sympathetic towards this view. The persistence and strength of the New York anti-fracking movement helped convince Democratic Governor Andrew Cuomo to ban fracking in 2015. Moreover, the fact that the relative economic benefit of shale gas extraction in New York was likely to be small facilitated this decision, particularly since New York could do so at little cost. Today, the

state imports significant quantities of Pennsylvania shale gas, a fact that has drawn criticism from both fracking opponents and proponents.

By contrast, in Pennsylvania, the historical influence of the fossil fuel industry led to a much stronger policy settlement, and a weak anti-fracking movement gave political decision-makers little incentive to challenge the status quo. In Pennsylvania, shale policy development was also controlled by a Republican dominated legislature, and a Republican governor expressly committed to the expansion of the shale gas industry. Under these circumstances, it is unlikely that even a popular anti-fracking movement could have disrupted the policy status quo. As it happened, the passage of Act 13 in 2012 continued a Pennsylvania tradition of prioritizing resource extraction over environmental preservation. Act 13 reforms to the Pennsylvania Oil and Gas Act only slightly increased environmental protections for shale drilling, and implemented a modest natural gas impact fee. This allowed Pennsylvania to retain the distinction of being the only major energy producing state to not impose a severance tax on the production of natural gas.

In New York and Pennsylvania, shale policies were influenced by a combination of history, trends in political partisanship, interest group mobilization, contingent events and particular strategic actions. Each state's history of resource extraction provided a crucial condition for understanding the unfolding of political processes, actions, and events. Thus, I have emphasized an understanding of historical influence as contextual and interactive, rather than simply determinative. This is a key aspect of a minimalist approach to path dependence. Unlike strong path dependency theories, a minimalist approach does not require that historical persistence occurs through "self-reinforcing processes" or "institutional lock-in." Rather, a minimal path dependence theory argues



that event cascades may be structured by various combinations of preexisting structural conditions, conjunctural conditions, and contingent events and strategic actions (Sewell 2005: 109). Emphasis is placed on the emergent properties of event cascades that result in a “rolling inertia [that] allows for continuous flux within a stable mode of operation” (Molotch et al. 2000: 819). A multiplicity of factors propelled New York and Pennsylvania on particular paths of shale policy development. However, these states’ histories of resource extraction provided a necessary context for understanding the overall logic of the trajectories observed in each state.

The goal of this project has been to explain a historically specific set of events and outcomes. Nevertheless, this research does have broader implications for understanding shale policy development in other U.S. states. In seeking to understand why states adopt more or less stringent environmental policies for unconventional drilling and fracking, scholars have paid relatively little attention to states’ extractive and environmental histories. Researchers have found that the oil and gas industry has considerable influence over shale policies in major energy producing states (Cook 2014; Rabe and Borick 2013). Yet, studies have largely offered a “snapshot” view that fails to place contemporary events within longer historical context. I have shown that the longer extractive and environmental histories of states significantly influence shale policy development.

This finding supports a revision of “race-to-the-bottom” theories of environmental regulation to account for how historical patterns of economic development play into policymakers’ assessments of competitive advantage. It also highlights that, in energy dependent states, the influence of the fossil fuel industry is not only rooted in raw

political power, but in historical patterns of industry influence, resource management, and environmental interests that structure the political context of policymaking, and subsequently shape the choices of policy actors. Even in major energy producing states, the political influence of the fossil fuel industry often far exceeds its relative contribution to a state's economy (Hochschild 2018). This study has shown that historical analysis offers a fruitful strategy for gaining insight into the relative influence of energy and environmental interests in states with shale energy resources.

## APPENDIX A

### THE STRINGENCY OF STATE REGULATORY APPROACHES PRIOR TO THE SHALE GAS BOOM

Procedurally, policy development in New York was substantially different from that in Pennsylvania. New York's environmental regulations for oil and gas were largely established under the SEQRA, a process without equivalent in Pennsylvania. Did this translate into the establishment of substantially different regulatory regimes? Appendix A provides a detailed analysis of the stringency of oil and gas regulations in New York and Pennsylvania. I find that while New York had slightly stronger regulations for a few measures, prior to the Marcellus Shale gas boom, oil and gas regulations within these states were very similar.

The SEQRA granted regulators in New York a potentially stronger mechanism for addressing the environmental impacts of oil and gas E&P. Historically, political decision-makers have considered the economic benefits of energy projects to outweigh their environmental and social costs. By contrast, the SEQRA explicitly required the NYSDEC to balance social and economic goals with environmental concerns in making a determination on oil and gas E&P. Did New York regulators utilize the SEQRA process to establish a modern oil and gas regulatory program that weighed environmental concerns more heavily than their southern neighbor did? If so, the divergent shale policies of these states may be partly explained by differences in institutional policy structures.

The shale energy boom has stimulated increased research on state oil and gas policies and heterogeneity in state shale regulations (Brannon, Shepard, and Van Nostrand 2012; Richardson et al. 2013; Krupnick, Richardson, and Gottlieb 2015). However, to the best of my knowledge, researchers have yet to systematically compare state oil and gas regulations prior to the shale energy boom. I modify the approach taken by Richardson et al. (2013) to evaluate the strength of New York and Pennsylvania's oil and gas regulations in 2007 before unconventional drilling led to policy revisions. Regulatory settings for New York are obtained from the GEIS (New York Department of Environmental Conservation 1992). Pennsylvania regulations were coded using Chapter 78 and Chapter 79, Title 25 of the Pennsylvania Code. I used versions published online by the Internet Archive on February 6, 2007 (Commonwealth of Pennsylvania 2007a, 2007b).

As with environmental policy generally, state oil and gas policies encompass numerous regulations that often involve detailed technical specifications. To facilitate comparative research, studies of state environmental policy often employ index measures such as the Green Index and the FREE Index to summarize large amounts of qualitative data (Fund for Renewable Energy, and the Environment 1988; Renew America 1989; Hall and Kerr 1991; Konisky and Woods 2012). I follow a similar strategy in creating the Oil and Gas Policy (OGP) Index. Twenty measures were selected for inclusion in the index based on a review of previous research on state oil and gas policies and standards adopted by the IOGCC (Brannon et. al 2012; Richardson et al. 2013). These are regulatory tools used by various states to minimize pollution and other environmental hazards from oil and gas drilling. Each state's OGP Index score equals the total number

of policies adopted by that state and provides an indicator of the strength of state policy initiatives. Higher scores indicate stronger environmental policies for oil and gas development. In addition, I examine in greater detail the specific settings of a few key regulations (i.e., well setback restrictions, surface casing depth requirements, and well idling and abandonment restrictions).

Table A1.1 presents the measures and scores for the OGP Index for New York and Pennsylvania. New York received a positive score for ten out of twenty measures, while Pennsylvania had a score of eight. This suggests that New York's oil and gas regulatory program was only slightly stronger than Pennsylvania's. These states similarly imposed well setback, and well idling and abandonment restrictions, as well as, well surfacing casing requirements. In fact, New York and Pennsylvania had the same score on all but four of the twenty indicators comprising the OGP Index. New York prohibited open pit storage of certain drilling wastes and the use of evaporation ponds for wastewater disposal while Pennsylvania did not. New York also required well operators to keep records regarding the transportation of wastewater while in Pennsylvania only those transporting wastewater were required to do so. By contrast, Pennsylvania had a liability presumption policy that was not observed in New York. In Pennsylvania, well operators were presumed liable for water pollution identified within 1,000 feet of a well, which occurred within 6 months of the drilling or alteration of a well. While neither New York or Pennsylvania required pre-drill water well testing, this practice was encouraged by Pennsylvania's policy, which allowed operators to use pre-drill testing to rebut the presumption of liability for water well pollution.

**Table A1.1 Oil and Gas Regulation Index: Measures and Scores for NY and PA**

<b>Regulation</b>	<b>Does state...</b>	<b>NY</b>	<b>PA</b>
Building setback	require a minimum distance between wells and buildings?	Yes	Yes
Water setback	require a minimum distance between wells and surface or underground waters?	Yes	Yes
Water well testing	require well water testing prior to drilling?	No	No
Liability	presume operator liability for water pollution occurring within a certain distance of well site?	No	Yes
Surface casing	require surface casing to be a minimum depth below fresh groundwater?	Yes	Yes
Cement specs	require minimum cement specifications?	Yes	Yes
Surface cementing	require minimum excess cement to be circulated around the surface casing?	Yes	Yes
Water withdrawal	limit the amount of water that may be withdrawn for well operations?	No	No
Fluid disclosure	require operators to disclose information about fracking chemicals?	No	No
Open pits	prohibit open pit storage for some drilling waste?	Yes	No
Disposal: injection	prohibit underground injection wastewater?	No	No
Disposal: stream	prohibit discharge of wastewater to streams?	No	No
Disposal: road	prohibit road spreading of wastewater?	No	No
Disposal: sewage	prohibit wastewater disposal via sewage treatment plants?	No	No
Disposal: evaporation	prohibit wastewater disposal via evaporation ponds?	Yes	No
Tracking	require operators to keep records regarding the transportation of wastewater?	Yes	No
Venting	impose non-discretionary standards for the release of excess gas into the air?	No	No
Flaring	impose non-discretionary standards for the burning of excess gas?	No	No
Well idling	limit how long a well can be idled without plugging?	Yes	Yes
Abandonment	limit how long a well may be temporary abandoned without permanently plugging?	Yes	Yes
<b>Index Total (max. 20)</b>		10	8

Further consideration of the specific settings of key regulations in Table A1.2 reveals some additional differences in the strength of New York and Pennsylvania's regulations. I focus on setback restrictions, surface casing specifications, and well idling and abandonment limits as these are important measures used to safeguard public safety and prevent water pollution. Building setback restrictions require a minimum distance between wells and private and public structures in order to reduce citizen's exposure to pollution and minimize other risks to health and safety. Building setbacks were slightly higher in Pennsylvania at 200 feet, while New York imposed a setback of 100 feet from a private dwelling and 150 feet from a public building or area. Water setback restrictions require a minimum distance between wells and surface and ground waters in order to reduce the risk of water pollution. State differences in water setbacks were also minor. Pennsylvania required a well setback of 100 feet from surface waters and 200 feet from private water wells, while New York required 150 feet from surface waters and private water wells. New York did impose additional EIS and SEQRA determination requirements on wells located near municipal water supply wells. However, it is difficult to measure the stringency of case-by-case permitting in such instances.

**Table A1.2 Settings of Key Regulations in New York and Pennsylvania**

<b>Regulation</b>	<b>Description</b>	<b>NY</b>	<b>PA</b>
Building setback	Minimum distance between wells and buildings (feet)	100	200
Surface water setback	Minimum distance between wells and surface waters (feet)	150	100
Water well setback <sup>a</sup>	Minimum distance between wells and private water wells (feet)	150	200
Surface casing depth	Minimum surface casing depth below fresh groundwater (feet)	75	50
Casing depth in primary aquifers	Minimum surface casing depth within primary and principal aquifers (feet)	100	50
Excess cement	Minimum excess cement circulated around surface casing (percentage)	25	20
Excess cement in primary aquifers	Minimum excess cement circulated around surface casing within primary and principal aquifers (percentage)	50	20
Well idling	Length of time operator may leave an idle well unplugged (months)	3	12
Well abandonment	Length of time operator may abandon well without a permanent plug (years)	2	6

<sup>a</sup>New York required a supplemental EIS for wells drilled less than 1,000 feet from municipal water supply wells and a site specific assessment and SEQRA determination for wells between 1,000 and 2,000 feet of municipal water supply wells.



The specification of well construction is another important area of regulation since wellbores generally must pass through underground water sources. To prevent the pollution of fresh water aquifers, regulators impose surface casing requirements. A surface casing is a string of steel pipe that is set in the well bore with cement in order to isolate freshwater zones and protect water quality. Surface casing depth requirements were slightly greater in New York. New York required that surface casings reach a minimum depth of 75 feet below fresh ground water, while Pennsylvania required a minimum depth of 50 feet. In addition, New York required a higher surface casing depth of 100 feet below primary and principal aquifers. Additional requirements for primary and principal aquifers were not observed in Pennsylvania. New York also imposed stronger cement circulation requirements for primary and principal aquifers while Pennsylvania did not. New York required that 50% excess cement be circulated around surface casings within primary and principal aquifers. For all other wells, New York required 25% excess cement, a figure similar to Pennsylvania's general requirement of 20% excess cement.

Restrictions on well idling and well abandonment also provide important protections to water quality and public health and safety. Historical oil and gas development left New York and Pennsylvania with a legacy of orphaned and abandoned wells, many of which remain unreported and unplugged. Wells that are abandoned without proper plugging can leak gas, oil, and/or brine, and pollute surface and groundwater. Methane migration associated with abandoned wells, which can be difficult to detect, may also cause explosions. To reduce these risks, New York and Pennsylvania restrict the amount of time a well may be idled without a temporary plug, or abandoned

without a permanent plug. New York's well idling and abandonment restrictions are stricter than Pennsylvania's. In New York, operators may idle a well for a maximum of three months, and abandon a well for a maximum of two years. Operators in Pennsylvania may idle a well for up to twelve months, and abandon a well for as long as six years.

Taken together, the OGP index score and the settings of key regulations suggest that, while New York's policy was stronger than Pennsylvania's, oil and gas regulations for these states were broadly comparable prior to the shale energy boom. New York prohibited open pit storage for some production waste, the use of evaporation ponds for wastewater disposal, and required operators to track the transportation of production waste. While Pennsylvania did not prohibit open pits or evaporation ponds, it subjected both practices to strict regulations (Pennsylvania Department of Environmental Protection 2001). Similarly, while Pennsylvania did not require operators to keep a record of transported wastes, it imposed detailed recordkeeping requirements on transporters (Pennsylvania Department of Environmental Protection 2001). In addition, Pennsylvania's presumption of liability clause provided an incentive for pre-drill water well testing and pollution prevention not observed in New York State. In terms of regulatory settings, New York also appears to have adopted a somewhat stronger regulatory approach than Pennsylvania. In particular, New York imposed stronger requirements in especially sensitive areas within primary and principal aquifers, and for well idling and abandonment. However, Pennsylvania imposed stronger building and water well setbacks than New York, and had only slightly lower requirements for excess

cement. Overall, this comparison suggests relatively similar regulatory programs for oil and gas E&P in these states.

While the measures included in this research provide a broad picture of state oil and gas regulations, it is important to recognize the limitations of the current analysis. This study does not include data on all environmental regulations relevant to oil and gas development, nor does it include information on enforcement or outcomes. Data on pre-shale boom regulations in other states would also have provided additional reference points for determining the strength of New York and Pennsylvania's regulations. However, recent research lends support to my findings. Richardson and colleagues (2013) examined state oil and gas regulations as of 2013 and found that New York and Pennsylvania similarly ranked higher than most other oil and gas producing states in the number of elements regulated and the average stringency of quantitative measures (Richardson et al. 2013).

## APPENDIX B

### LEGISLATIVE HEARINGS

This appendix further discusses the methods and sources used to collect legislative hearing data in New York and Pennsylvania. It also provides a more detailed presentation of the frequency of testimony by interest groups at individuals hearings in these states.

Only hearings held by the Pennsylvania House of Representatives and the New York State Assembly are included in this project. Because the Pennsylvania Senate has no rule that requires them to keep or publish records, data availability for this chamber was severely limited. This analysis only includes hearings, which had oil and gas exploration and production as the primary topic.

For Pennsylvania, legislative hearings were identified through the Pennsylvania Policy Database Project (McLaughlin et al 2010). The Pennsylvania Policy Database (PPD) was modeled after the Policy Agendas database, a publically available resource which tracks federal policy since 1946 (Baumgartner and Jones 2009). The PPD contains information on government activities and attention to public policy issues within the Commonwealth since 1979. The PPD research team provided me with a comprehensive database of Pennsylvania House hearings held between 1979 and 2013. I utilized this database and a search engine provided by the Pennsylvania General Assembly to identify all hearings on the subject of oil and gas E&P for the years 1995 to 2016. Hearing transcripts were obtained from the Pennsylvania General Assembly's website ([http://www.legis.state.pa.us/cfdocs/Legis/TR/Public/tr\\_finder\\_public.cfm](http://www.legis.state.pa.us/cfdocs/Legis/TR/Public/tr_finder_public.cfm)).

New York State Assembly hearing data was obtained through the New York State Library. I contacted the New York State Public Information Office and the New York State Legislative Library, and was informed that this was the best way to identify and obtain transcripts of legislative hearings in this state. Hearings were identified using key word searches of the library's catalog (<https://nyst.sirsi.net/uhtbin/cgisirsi/x/x/0/49/>). Under "words and phrase," I entered "Hearing" and "Assembly" and "New York" and ("gas" or "oil" or "shale" or "Marcellus" or "fracturing" or "hydrofracturing" or "fracking"). I also reviewed the websites of relevant committee of New York State Assembly to verify that the most recent hearings were included. In most cases, transcripts were available through the library's website. I also visited the New York State Library in Albany, NY and personally digitized some transcripts.

Once hearing transcripts were obtained for both states, I manually reviewed testimony and created a database with descriptive information for all witnesses. For some New York hearings, submitted testimony was also available. While witnesses that submitted written testimony only were also entered, I could not use this information due to a lack of comparable data for New York. I utilized hearing transcripts and targeted searches online to code a number of variables for hearing witnesses including: organizational affiliation, organizational post, organizational form, political party, interests represented, and position towards unconventional natural gas development.

**Table A2.1 Frequency of Testimony by Interest Categories: NY, 1995-2016**

Interests Represented <sup>a</sup>	"House" Hearing Date <sup>bc</sup>						Pre-Shale	Shale
	16-Nov-04	15-Oct-08	15-Oct-09	26-May-11	6-Oct-11	10-Jan-13	1995-2008	Boom 2009-2016
Legislature elected members	4	14	7	5	12	16	18	40
Federal & inter-state agencies	0	2	2	0	1	1	2	4
State agencies	2	3	3	0	5	0	5	8
Local/county government	1	5	2	0	1	3	6	6
Oil & gas interests	10	4	3	2	2	4	14	11
Environmental interests	0	6	14	5	36	35	6	90
Landowner interests	4	0	0	0	1	2	4	3
Other business associations	4	1	3	0	2	1	5	6
Professional & gov't associations	0	2	0	0	1	3	2	4
Research & academic experts	2	3	2	4	5	5	5	16
<b>Total</b>	<b>27</b>	<b>40</b>	<b>36</b>	<b>16</b>	<b>66</b>	<b>70</b>	<b>67</b>	<b>188</b>

<sup>a</sup>Each organization represented by an individual counted as a separate case. Written testimony only not included.

<sup>b</sup>All hearings held by the NYS Assembly's Environmental Conservation Committee.

<sup>c</sup>The first hearing was held in Elmira, NY and addressed the Trenton Black-River play. All others held in Albany, NY and pertained to the NYSDEC's SGEIS on fracking.

**Table A2.2 Frequency of Testimony by Interest Categories: PA, 1995-2016**

Interests Represented <sup>a</sup>	House Hearing Date											Pre-Shale 1995-2008	Shale Boom 2009-2016
	30-Sep-08 <sup>b</sup>	31-Mar-09 <sup>b</sup>	3-Apr-09 <sup>c</sup>	15-Apr-09 <sup>b</sup>	18-Feb-10 <sup>d</sup>	7-Apr-10 <sup>e</sup>	11-May-10 <sup>f</sup>	12-May-10 <sup>g</sup>	13-May-10 <sup>h</sup>	20-May-10 <sup>i</sup>	16-Sep-10 <sup>j</sup>		
Legislature elected members	10	25	5	19	5	10	4	5	4	4	5	10	86
Federal & inter-state agencies	2	0	0	0	1	0	0	0	0	0	0	2	1
State agencies	2	0	2	0	3	0	0	1	0	2	0	2	8
Local/county government	0	1	0	0	0	0	4	1	7	3	4	0	20
Oil & gas interests	3	1	1	4	2	0	2	0	0	1	3	3	14
Environmental interests	0	1	2	0	1	4	2	7	5	7	0	0	29
Landowner	0	0	0	0	0	0	0	0	2	0	0	0	2
Other business associations	0	0	0	0	0	0	0	0	0	0	0	0	0
Professional & gov't associations	0	0	2	0	0	0	2	4	0	1	0	0	9
Research & academic experts	0	0	1	2	0	0	0	0	0	0	0	0	3
Labor unions	0	0	0	0	0	0	0	0	0	2	10	0	12
Total	17	28	13	25	12	14	14	18	18	20	22	17	184

<sup>a</sup> Each organization represented by an individual counted as a separate case. Written testimony only not available.

<sup>b</sup> Hearing held by Environmental Resources and Energy Committee in Harrisburg, PA.

<sup>c</sup> Hearing held by Appropriations Committee in Harrisburg, Pennsylvania.

<sup>d</sup> Hearing held by Environmental Resources and Energy Committee in Clearfield, PA.

<sup>e</sup> Hearing held by Environmental Resources and Energy Committee in Shavertown, PA.

<sup>f</sup> Hearing held by Finance Committee in Indiana, PA.

<sup>g</sup> Hearing held by Finance Committee in Williamsport, PA.

<sup>h</sup> Hearing held by Finance Committee in Shawnee on the Delaware, PA

<sup>i</sup> Hearing held by Finance Committee in Washington, PA

<sup>j</sup> Hearing held by Labor Relations Committee in Scranton, PA



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