1 Introduction

Stories from the US energy sector

If the world is to achieve a clean energy transition, the role of the US will be crucial. Not only does the US have enormous global influence, but it is also the largest producer of oil and gas with the largest reserves of coal on the planet. But this is not a book about the US state per se, rather it is about business actors in the US energy sector. This is because without overcoming the political resistance of incumbent fossil fuel industries, it is almost impossible to imagine an energy transition occurring. After all, if policymakers in the US and around the world are to succeed in their attempts to regulate energy and limit greenhouse gas emissions, they will not only need to overcome the resistance of industries that have generated great wealth from burning fossil fuels, but they will also need to build and expand support among renewable energy industries, such as wind and solar power.

In this context, it is important to understand business behaviour. Numerous studies have demonstrated the influence of business actors across multiple policy domains, including in environmental politics. Yet there is less literature on the behaviour of business actors in individual energy-centric industries, namely the oil, gas, coal, utility, and renewable industries (Levy and Kolk, 2002; Meckling, 2011; Skjaerseth and Skodovin, 2003; Newell and Paterson, 1998). And, few studies, if any, have examined the behaviour of business actors in individual energy-centric industries in contemporary policy contests in the US. This book seeks to redress this gap not only to improve our understanding of business behaviour in this critical sector, but also to draw out lessons for policymakers seeking to regulate these industries.

Contemporary policy contests in US energy sector provide an excellent window into business behaviour in the above industries.

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On 7 January 2014, a cold, frigid day in Washington DC, oil and gas executives from around the country gathered for lunch. The occasion was an

annual one, the launch of the American Petroleum Institutes' (API) State of the Energy report. Inside the beltway, gatherings like these are a regular affair, but the API is not a regular industry association. It is arguably the most powerful industry association in the most powerful sector of the US economy, the oil and gas industry. Its more than 500 members have combined revenues in the trillions of dollars and include some of the world's largest corporations, such as ExxonMobil, Chevron, and Shell. When the API speaks, Washington listens.

As the attendees sat down to lunch, the speaker was a familiar face, Jack Gerard, President and CEO of the API. Gerard is an old hand in Washington, having led the American Chemistry Council and the National Mining Association prior to his ascendency at the API. This was not his first State of the Energy report, but this year was different. The oil and gas industry was booming. As a result of the shale revolution, the US had overtaken Russia as the largest gas producer in the world and it was now on track to do the same for oil. There was only one problem; the export of US crude oil was banned and had been since 1975 and the OPEC oil crisis (GAO, 2014).

Many in the room were determined to change that. Jack Gerard assured them that the API would lead the charge.

> We will decide if America continues its march toward global energy leadership – a once in a generation choice – or remains content to play a supporting role in the global energy market. We can erase what for decades has been America's greatest economic vulnerability – our dependence on energy sources from other continents, particularly from less stable and friendly nations – and fundamentally alter the geopolitical landscape for decades to come, all while providing a much needed boost to our economy. But only if we get our energy policy right.
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> (Gerard, 2014)

The right energy policy was to put an end to the de facto ban on crude oil exports. In the months that followed, the API and its members would spend hundreds of millions of dollars making sure that happened. The API was supported by some powerful allies. The next day the US Chamber of Commerce declared its support calling for the ban to be lifted (Mundy, 2014a). Others soon joined, but not everyone was happy. Some in the industry, particularly oil refiners, believed they had much to gain from keeping crude oil on American shores. Exports, they argued, would only increase domestic oil prices and with it their costs of production. But the stage was set; many of the most powerful corporations and associations in the US had begun to mobilise to repeal a law that had been in place for 40 years.

* * *

Mike Duncan, like Jack Gerard, was another journeyman in Washington DC having made his name in the Republican Party in the 1980s and 1990s and ultimately becoming chairman of the Republican National Committee in 2007. Now he was President and CEO of the American Coalition for Clean Coal Electricity (ACCCE), an industry group formed in 2008 to promote coal. But the industry he represented was not in the same shape as oil and gas; coal was not so much booming as busting. In the US coal production is declining, the number of producing mines is declining, productive capacity is declining and the number of employees at coal mines is declining (EIA, 2016a). And thanks in part to the shale boom, its share of electricity generation has fallen from more than half in 1990 to around a third today (EIA, 2017b: 74). The problem for Mike Duncan and the coal industry was that this decline was being accelerated by what they claimed was President Obama's 'war on coal'. On 25 June 2013, fresh from his second inauguration, President Obama launched the latest battle in this so-called war by targeting pollution from coal-fired power plants. Unlike Jack Gerard who was advancing his troops, Mike Duncan was holding the line. A day after the announcement, Mike Duncan went to the offices of the Business Roundtable, which stand in the shadow of the United States Congress on New Jersey Avenue, to deliver his war cry. In attendance were many of the most powerful coal and utility firms in the country, including Peabody Energy and Southern Company.

> Yesterday's news on carbon regulations was a disappointment, but not a surprise. We have seen this threat coming down the road for a while, and yesterday it finally knocked on our door. The President views this as a 'legacy' issue. And on this point, he and I agree. But that 'legacy' is going to be higher energy costs, less reliable electricity, lost jobs and a shattered economy. Even before the President's call for carbon regulations the EPA was extracting pound after pound of flesh from the coal industry.… Our industries can only endure so much. Our economy can only endure so much. The fight before us will come in two stages, one inside the Beltway and one outside. The first round will be fought here in Washington, as public comments are gathered. The second will take place at the state level, as state governments develop plans to meet the proposed standards.
>
> (Duncan, 2013)

It was not the last time Mike Duncan would give this message. Indeed, he would deliver it again, and again, as the war on coal raged and the coal industry fought the administration. Given that coal contributes more greenhouse gas emissions than any other fossil fuel, the battles would have enormous implications for climate change.

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For Rhone Resch it was a battle of a different kind. For more than a decade he had been President and CEO of the Solar Energy Industries Association (SEIA), the peak industry association for solar. Unlike Jack Gerard and Mike Duncan, Rhone Resch was not the same type of Washington journeyman, but he knew the city well enough having served at the EPA in the Clinton administration and worked for the Natural Gas Supply Association. However on 20 October 2014, Rhone Resch was far away from Washington DC, in Las Vegas, Nevada. The reason was the Solar Power International Expo, which his organisation co-hosted. On a warm Las Vegas afternoon, as he stepped out to deliver the keynote address, he was greeted by representatives from hundreds of solar firms, including some of the largest in the world. The solar industry was flourishing in the US. Solar was adding more new capacity than wind. One of the reasons was the Investment Tax Credit (ITC). Established in 2006, it reduced federal income taxes by 30 per cent for capital investments in solar systems on residential and commercial properties. Since the ITC was created, annual solar installations had grown by more than 1,600 per cent, transforming the industry from an $800 million industry in 2006 to a $15 billion one in 2014. Yet the tax credit was due to expire in 2016 and many in the industry feared the worst. The wind industry had been devastated by uncertainty over a similar tax credit the year before. As a result, the solar industry wanted to extend the ITC.

> Today, I'm going to make you a promise: As sure as World War I started in 1914, if the Koch Brothers and their allies come after solar, 2014 will be the beginning of World War III. It's not going to be easy. And, yes, we will be fighting an uphill battle every step of the way.… So today is the official kick-off of our efforts to extend the 30 per cent solar ITC past 2016. Despite the craziness in Washington, D.C., I believe we can win. But being in Vegas should also remind us that we're facing some pretty tough odds again. Make no mistake about it. This absolutely is going to be a long, hard, uphill battle. But by sticking together – and working together – we can be successful once again, just as we were nearly a decade ago.
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> (Resch, 2014)

Rhone Resch's words may have been exaggerated, but like any good general he was there to rally the troops. While the extension of the ITC may not have been a question of survival for the solar industry, its expiration would no doubt harm it, which is what many in the oil, gas, coal, and utility industries wanted. This was more than just a battle over a federal tax credit. It was also symbolic of a larger war between the new kids on the block in the renewable industries and the incumbents in the fossil fuel industries that had dominated US energy policy for the last 100 years.

* * *

As these examples show, business actors are actively engaged in policy contests across the US energy sector and there is little doubt that they are having an impact. To be sure, numerous studies have demonstrated the influence of business actors across multiple policy domains, yet less work has focussed on the domain of energy (for a review of this literature see Clapp and Meckling, 2013; Tienhaara, 2014). This is somewhat of a surprise given that business actors in the energy sector are central to the problem. In fact, recent evidence shows that just 90 companies are responsible for two-thirds of global greenhouse gas emissions and many of these operate in the US. They include Chevron, ExxonMobil, BP, Shell, ConocoPhillips, and Peabody Energy, all of which have significant US operations. Indeed, together these companies have been responsible for around 13 per cent of all global carbon dioxide and methane emissions since 1751 (Heede, 2014).

Accordingly, in this book, I ask two central questions: (i) how and why are business actors shaping energy policy contests in the US? And (ii) what are the lessons for policymakers? To answer these questions I examine the role of business actors in the oil and gas industries, coal and utility industries, and wind and solar industries across six contemporary policy contests that have taken place during the Obama administration (2009–2016). An exclusive focus on business actors enables a closer analysis of how and why business actors succeeded in exerting influence over the policy process. For example, how and why did oil and gas producers seek to lift the ban on oil exports? How did they seek to frame the contest? Did they lobby, or develop other strategies? And if so, why? Given that resistance from fossil fuels industries to regulation, including oil producers, could delay and even derail government attempts to achieve an energy transition, understanding how these actors behave is of critical importance (Hess, 2014).

Finally, in answering these questions the aim is to build on the empirical insights to identify specific strategies for policymakers seeking to overcome the political resistance of these incumbent industries, and build coalitions in support of policies that encourage the widespread deployment of clean energy, and crudely speaking, reduce the reliance on dirty energy. While the focus is on policy contests in the US, as an energy superpower what happens in the US will have a ripple effect around the world as policymakers in other nations grapple with the same task.

The energy challenge

The global challenge

The climate is changing, and the cause is greenhouse gas emissions. Since the Industrial Revolution, greenhouse gas emissions have increased every year and as a result so too has the temperature of our atmosphere and our oceans. Each of the last three decades has been warmer than any decade

since 1850 (IPCC, 2014) and 2016 was the hottest year in recorded history, the third year in a row to record this mark (NASA, 2017). The impacts have been felt around the world including sea level rise, storms, droughts, fires, floods, and famines, not to mention widespread extinctions. Without action, it is projected that global average temperatures will rise by between 4°C and 5°C by the end of the century, rendering parts of the globe uninhabitable (IPCC, 2014).

To avoid the worst impacts of climate change, global temperatures must be kept 'well below' 2°C and ideally below 1.5°C. This is the overarching aim of the Paris Agreement, which was signed in 2015, entered into force less than 12 months later in November 2016, and has now been ratified by 178 nations (UNFCCC, 2018). This is a significant achievement given that it took almost a decade for the Kyoto Protocol to come into force, the last major climate agreement signed in 1997. To achieve this aim, parties to the Paris Agreement have completed national plans – or intended nationally determined contributions (INDCs) – that set out the actions they will take to reduce emissions, such as limiting deforestation or reducing their reliance on coal (UNFCCC, 2015). Many nations, including China, the largest emitter in the world, are on track to meet the targets set out in their INDCs (IEA, 2016b).

However, even if the Paris Agreement is fully implemented, the United Nations estimates that the world will remain on track to increase global average temperatures by 3.2°C by 2100, well above the 2°C limit scientists have warned is necessary to avoid climate catastrophe (UNEP, 2017: xviii). In order to achieve the 2°C target, global greenhouse gas emissions must peak almost immediately and decline sharply to 2100 (Figueres *et al.*, 2017). No easy task, remembering that emissions have risen every year since the Industrial Revolution, and they continue to do so, albeit more slowly. Such is the challenge that most scenarios that seek to limit emissions to below 2°C or 1.5°C assume the deployment of negative emissions technologies. For example, scenarios often combine carbon capture and storage technologies with biomass energy, which permanently remove carbon dioxide from the atmosphere. While such technologies are technically possible, their deployment at scale is untested (Rogelj *et al.*, 2016).

In this context the International Energy Agency (IEA) has long argued that the world needs an 'energy revolution', which results in a rapid transformation to a low carbon system of energy supply (IEA, 2008). As the source of more than two-thirds of global greenhouse gas emissions, it is not hard to see why transforming the energy sector will be crucial (IEA, 2015a). Yet just over 80 per cent of the world's primary energy supply continues to be met by fossil fuels, and, strikingly, this has hardly changed in 40 years. In 2015, oil's share was 31.7 per cent, coal 28.1 per cent and gas 21.6 per cent. Further renewable energy, excluding hydro, has increased from 0.1 per cent of total primary energy supply in 1973 to only 1.5 per cent today – see Figure 1.1.

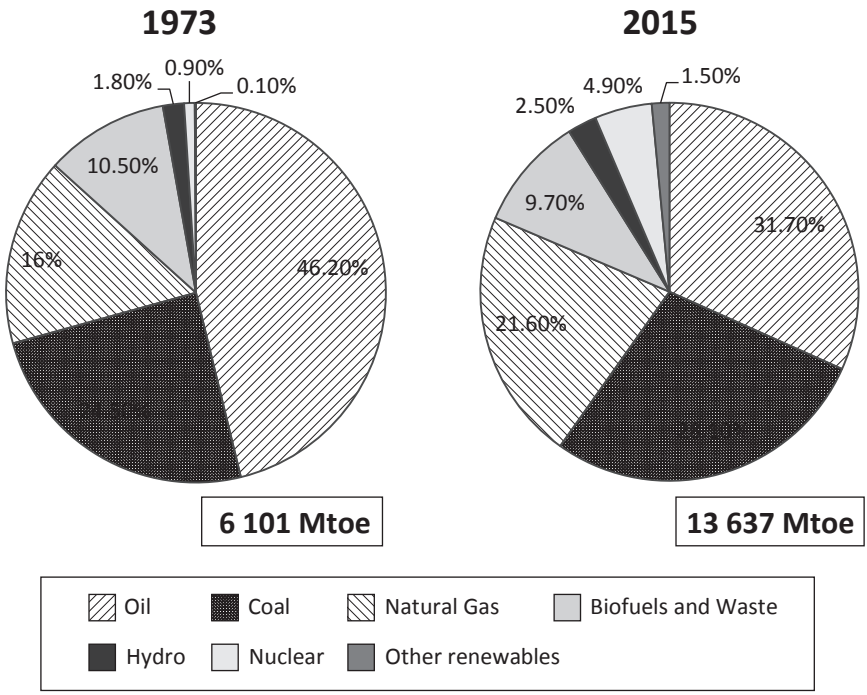

Figure 1.1 World total primary energy supply by fuel.
Source: International Energy Agency (IEA, 2017a).

Recent modelling by the IEA highlights the challenge the energy sector faces to meet the aims of the Paris Agreement. Taking a scenario with a 66 per cent probability of limiting global average temperatures to no more than 2°C, the IEA estimates that the energy sector's carbon budget between 2015 and 2100 – the cumulative amount that can be emitted over that time period – to be 790 gigatonnes (Gt) of carbon dioxide (IEA/IRENA, 2017: 112). As the IEA points out, achieving this would 'require an energy transition of exceptional scope, depth and speed' (IEA/IRENA, 2017: 7). The share of fossil fuels in primary energy demand would halve between 2014 and 2050, while the share of low-carbon sources, including renewables, would more than triple to reach 70 per cent of global energy demand in 2050. As a result, by 2050 almost 95 per cent of electricity would be low-carbon, 70 per cent of new cars would be electric, the entire building stock would have been retrofitted and the carbon intensity of the industrial sector would be 80 per cent lower than present (IEA/IRENA, 2017: 8). And all of this is required for just a 66 per cent chance of limiting temperatures to 2°C, when the science shows 1.5°C is required to avoid the most devastating impacts of climate change.

The US challenge

What does this mean for the US? As the second largest greenhouse gas emitter in the world, the role of the US will be central to achieving a clean energy transition. As Figure 1.2 shows, until it was overtaken by China in 2006, the US has been the largest greenhouse gas emitter for many decades, larger than the combined total of emissions from Western Europe. In total, the US contributes around 14 per cent of global greenhouse gas emissions, though its share is declining with the rise of China and India.

While the US position on climate change internationally has waxed and waned in recent decades (Downie, 2014a), under President Obama the US showed an increasing willingness to take action to limit emissions. In 2014 the US, together with China, announced targets for addressing climate change, with President Obama committing the US to reduce its emissions by 26 to 28 per cent below 2005 levels by 2025 (Landler, 2014). In 2016 President Obama, ratified the Paris Agreement adopting the 2014 targets as part of the US nationally determined contribution to the negotiations.

However, recent projections show that even if the initiatives introduced by President Obama were implemented the US would still miss its Paris target by 2025. This includes assuming that the Clean Power Plan is implemented, which was expected to represent half of all emissions reductions contained in current and proposed regulations (Greenblatt and Wei, 2016). With the election of President Trump the emissions

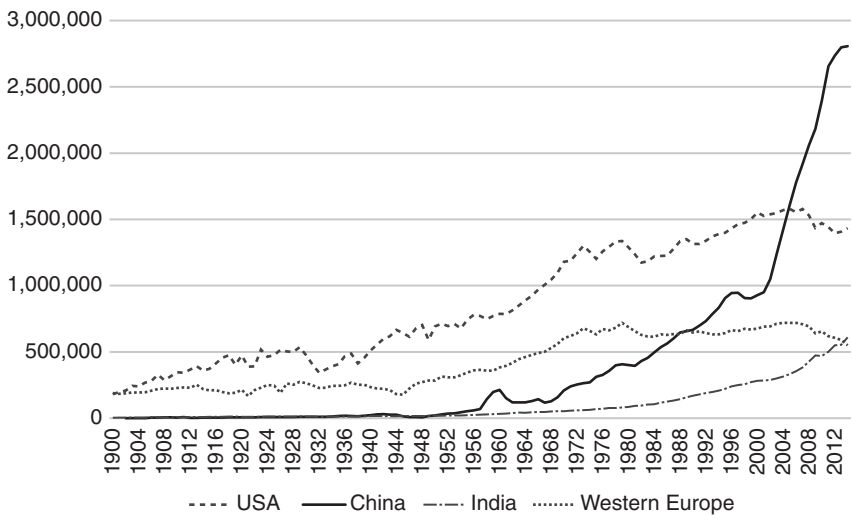

Figure 1.2 Historical CO_2 emissions.

Source: Data from the Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory (Boden *et al.*, 2017).

challenge will be even harder, especially given that the new President has announced that his administration will not only walk away from the Paris Agreement, but also that it will repeal many of the measures introduced by the previous administration, including the Clean Power Plan (The White House, 2017c).

Irrespective of the ultimate emissions target the US adopts in the future, meeting it will depend on the energy sector (IEA, 2016b: 319). Broadly, the US can be divided into five energy consuming sectors: electricity, industrial, transportation, residential and commercial sectors. Each of these sectors consume primary energy, around 80 per cent of which is supplied by fossil fuels (DoE, 2015). While there are many ways to generate electricity, in the US the sector is largely supplied by coal, natural gas, and nuclear sources, as I discuss below. The industrial, transportation, residential and commercial sectors, also consume most of the electricity generated, though this varies by sector. Of these, the industrial sector is the most diverse. As well as consuming electricity, it also consumes other energy sources directly, especially natural gas and petroleum, to support manufacturing, agriculture, construction, and mining. The residential sector, which includes homes and apartments, and the commercial sector, which includes office blocks, shopping malls, schools, and hospitals, to name a few, also consume electricity as well as natural gas. In contrast, the transportation sector consumes virtually no electricity and is almost entirely dominated by petroleum-based fuels, which are used to fuel cars, trucks, and planes, among others (DoE, 2015). In short, the US energy sector comprises more than simply electricity and there is a range of different energy markets that operate by different rules. For example, business actors in the oil sector operate in a very different environment from business actors in the electricity sector.

Nevertheless, energy-related emissions from these sectors comprise around 80 per cent of total US greenhouse gas emissions (EIA, 2016e: 22). As Figure 1.3 shows, emissions from petroleum have been the largest contributor in recent decades, though they have generally decreased since 2007, despite a recent rise. Coal emissions continue to fall, and have so since the financial crisis in 2007–2009. Emissions from natural gas, on the other hand, have risen since 2009, reflecting its growing share of electricity generation, as falling gas prices have pushed out coal generation (EIA, 2017d: 2). In fact, coal's share of electricity generation has fallen from 54 per cent in 1990 to 34 per cent in 2015. At the same time, non-fossil-fuel electricity generation, which includes nuclear power and renewables, has risen to the point that it equalled that of coal in 2015 (EIA, 2017d: 8). Most of the growth in non-fossil fuel generation has come from wind and solar, which as a share of non-fossil fuels, has grown from less than 1 per cent in 2000 to about 17 per cent in 2015. Whereas electricity generation from nuclear and hydro has fallen over the last two decades (EIA, 2017d: 9).

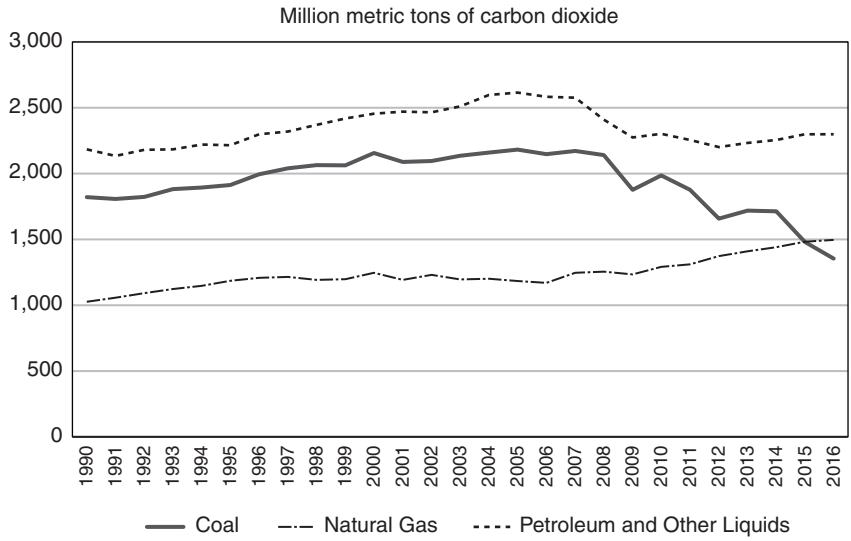

Figure 1.3 US energy-related carbon dioxide emissions by fuel, 1990–2016.
Source: US Energy Information Administration (EIA, 2016d).

Despite the fact that US energy-related carbon dioxide emissions have fallen since 2005 at an average rate of 1.4 per cent annually, they will need to fall much further if the US is to contribute to meeting the 2°C target set out in the Paris Agreement (EIA, 2017b). Recent projections of the US energy sector show that this will not occur without new policy initiatives (EIA, 2017b). The US Energy Information Administration (EIA) projects in its reference case, which assumes that current laws and regulations remain unchanged, such as the Clean Power Plan, that energy-related carbon dioxide emissions will fall by 0.2 per cent annually between now and 2040. In other words, at a slower rate than since 2005.[1] In the electricity sector, for example, it is projected that coal-fired power plants are replaced with new natural gas, solar, and wind capacity, with no significant new nuclear capacity added, as more nuclear capacity is retired than built. Nevertheless this is not enough if the US is to meet its Paris targets. Further, the EIA projects energy-related emissions to be highest in its 'No Clean Power Plan' scenario, which appears the most likely scenario under the current administration (EIA, 2017b).

In summary, if the world is to meet the Paris climate targets, transforming the energy sector will be vital. The energy sector contributes around two-thirds of greenhouse gas emissions. In the US it is starker still with 80 per cent of total emissions energy-related. Accordingly, what is required, as the IEA has argued, is an energy transition of exceptional scope, depth,

and speed. Yet the most recent projections show that the world is off track with 80 per cent of primary energy demand continuing to be met by fossil fuels.

The US political environment

Any attempt by the US to take a leading role in achieving an energy transition will not be easy in a political environment characterised by increasing partisanship, especially in the area of climate and energy policy. Since the 1970s congressional politics in the US has shifted away from the norms of cooperation when centrists in both parties regularly cooperated on major issues, to become deeply partisan. This change has coincided with the rise of a dominant conservative faction within the Republican Party, which has squeezed out the moderates, and both parties are now markedly more ideologically homogenous (McAdam, 2017: 195–196). As a result, policy-making in the US is increasingly fraught and many respondents interviewed for this book regularly described a Congress that is 'frozen' or in constant 'gridlock'.

The growing partisanship is especially acute in the area of climate and energy policy where Conservatives and Democrats maintain diametrically opposed visions. In the US, conservatives share a disdain for environmental regulation and view it as a ploy by liberals to impose government control over American life. Conservatives that dominate the Republican Party are deeply sceptical about the ability of the federal government to address social and economic problems and believe that government regulation of the market should be resisted because, among other effects, it reduces individual freedoms, hampers business, and dampens economic growth (Layzer, 2012: Ch. 1). In the area of climate and energy and policy this translates into a resistance against any attempts to address climate change, which has long been viewed as a hoax among conservatives, with renewable forms of power often seen as antithetical to energy security and economic prosperity. In contrast, Democrats generally see a role for government to address the market failure of climate change and promote the transition away from fossil fuels towards cleaner sources of power (Adelman, 2017: 342–343).

The growing dominance of the conservative vision, especially within the Republican Party, is central to understanding the inability of Congress to act in this policy domain. Layzer (2012) argues that although conservatives have not been able to enact wholesale reforms to existing environmental laws, they have been instrumental in blocking efforts to pass major new environmental legislation or increase the stringency of existing laws. They have done so by building a conservative ideological network that since the 1970s has disseminated an anti-regulatory storyline to counter the environmental narrative, mobilised grassroots opposition to environmental regulation and undertaken sophisticated legal challenges to environment laws.

It is no coincidence that at the same time US public opinion has become deeply polarised on the problem of climate change. This was the conclusion of a recent review of polling data in the US, which showed that since the late 1990s opinion on global warming has divided across partisan and ideological lines (Egan and Mullin, 2017). For example, in 1997 equal shares of Democrat and Republican voters said the effects of global warming had already started. Fast forward two decades and the partisan difference on this question and grown by more than 30 percentage points. To make matters worse, action on climate change is not a salient issue, which means there is not a strong constituency for action. Even among Democrat voters that express concern about the issue, climate change is ranked well below many other national priorities. As a result of both the polarisation and low salience, there are often weak incentives for policy-makers to act (Egan and Mullin, 2017).

However, the soaring popularity of President Barack Obama who was inaugurated on 20 January 2009 led many to believe that his presidency could transcend the partisan political divide. In his first State of the Union address, President Obama proclaimed that 'the country that harnesses the power of clean, renewable energy will lead the 21st century' and he promised to increase the supply of renewable energy and work with Congress on 'legislation that places a market-based cap on carbon pollution and drives the production of more renewable energy in America' (The White House, 2009). Yet the reality of the US political environment was reinforced in the following months and years as Republican leaders made a strategic decision to oppose the new President on all issues, and especially climate and energy policy, with the goal of reducing his popularity.

By the 2010 mid-term elections, Republicans had re-taken a majority in the House and significantly reduced the Democratic majority in the Senate. On the back of their success congressional Republicans doubled down on their efforts to oppose the President and they were supported by segments of the fossil fuel sector and conservative advocacy groups, as I will discuss in the following chapters. Little changed in 2012, with Republicans maintaining control of the House and the Democrats control of the Senate. However, at the 2014 congressional elections the Republicans also took control of the Senate for the first time during the Obama administration (US Senate, n.d.). In short, in the aftermath of the 2010 elections the congressional landscape remained extremely difficult for an administration that had professed a desire to advance clean energy and limit greenhouse gas emissions.

Policy contests in the US energy sector

It was in this partisan political environment that business actors battled over key policy contests in the US energy sector. As Table 1.1 shows, in this book the focus is on a series of policy contests across the oil, gas, coal,

Table 1.1 Business battles in key policy contests

The policy contests	*General industry positions in contests*		*Policy outcome*
	Support	*Opposed*	
Gas exports	Oil and gas producers	Petrochemical manufactures	Restrictions on gas exports eased
Oil exports	Oil and gas producers	Oil refiners	Ban on crude oil exports overturned
Emissions trading	Sections of utility industry	Coal producers and sections of utility industry	Emissions trading defeated
Clean Power Plan	Sections of utility industry	Coal producers and sections of utility industry	Clean Power Plan delayed
Production tax credit extension	Wind	Sections of utility industry	Production tax credit extended and then phased out
Investment tax credit extension	Solar	Sections of utility industry	Investment tax credit extended and then phased out

utility, solar, and wind industries. While the outcomes of these contests were directly shaped by the power, preferences, and strategies of business actors, as I will discuss in the following chapters, they were also triggered by the wider transformations taking place in the US energy sector.

First, in the oil and gas industries the so-called shale revolution, which refers to the technology breakthroughs that have enabled producers in the US to access enormous onshore oil and gas reserves, has triggered contests over the exports of these commodities. In the case of gas, a sharp increase in domestic production precipitated a push by gas producers to ease export restrictions, which would enable them to more easily export natural gas to Asia and Europe and thereby take advantage of higher international prices. This sparked a bitter contest across the energy sector, especially from business actors that benefited from the abundance of domestic gas supplies, namely petrochemical manufacturers who did not want it exported. As I will discuss in Chapter 3, by 2016 many of these restrictions had been lifted and the first shipments of US natural gas were on their way to Europe.

The boom in shale gas has been replicated in oil. For decades the US has been dependent on foreign oil, but with a 30 per cent increase in production over the last decade the US has now surpassed Russia and Saudi Arabia as the largest producer of oil in the world (IEA, 2014a).[2] However, for 40 years the US had in place an effective ban on the export of crude oil. Oil produced in the US was to be consumed in the US. With the shale oil boom and surging US production, much like gas, a price spread developed between the domestic price for crude oil – the West Texas Intermediate – and the international price – the Brent. Between 2011 and 2014 the price of the WTI averaged $14 per barrel lower than the Brent (GAO, 2014: 7). Once again, producers pushed Congress to overturn the ban in order to access higher prices for their products on international markets. However, they were resisted by oil refiners that benefited from the price spread. Ultimately, the oil corporations were successful. By the end of 2015, the global oil price had plummeted wiping away the spread, but they had opened the way for future exports, the first of which left for Italy in December 2015 (Carroll and Tobben, 2016).

Coal's enormous contribution to climate change triggered a second set of policy contests in the coal and utility industries. The inauguration of President Obama in January 2009 set off the first contest. With the President's support Congress attempted to legislate a nationwide emissions trading scheme, which would set a cap on greenhouse gas emissions especially those from the electricity sector. The focus on the electricity sector reflected the fact that more than half of the coal produced in the US is used to provide electricity, and this increases to 90 per cent for steam coal (Witter, 2015c: 4). As a result, business actors in the coal industry, in particular, mobilised to oppose the legislation, while the utility industry split in part reflecting the varying use of coal in their generation portfolios.

The failure of this legislation led to a second attempt three years later, which was just as contested and led to similar divisions within and between industries. This time around President Obama directed the EPA to establish carbon pollution standards, with the aim to reduce emissions from power plants by 30 per cent from 2005 levels by 2030 (The White House, 2013b). Following the release of the proposed rules in 2014, the plan was finalised in August 2015 (EPA, 2015). However, the US Supreme Court granted a stay in February 2016, stopping the implementation of the Plan, which is now unlikely to be implemented in its current form with the election of President Trump (Adler, 2016).

A third set of policy contests surrounds the fact that in the US and around the world renewable energy is booming. This has set off a battle between the traditional incumbents in the energy sector and their rivals in the renewable energy sector, particularly in the wind and solar industries, over federal tax credits. In the case of the wind, one of the most important tax credits has been the production tax credit (PTC), which for wind was $23 per MWh in 2015 (DoE, n.d.) The PTC has been vital for the development of the wind industry, despite the fact that it has been renewed and revised multiple times creating significant uncertainty. Fortunately for the wind industry in 2015 they were able to secure an agreement that extends the PTC to 2019.

This contest was closely tied to a parallel contest in the solar industry over the ITC, which reduces federal income taxes by 30 per cent for capital investments in solar systems on residential and commercial properties (SEIA, 2015c). The ITC has been a boon for the industry since it was established in 2006, with dramatic increases in utility scale and small scale solar. As part of the same agreement that extended the PTC in 2015, the solar industry secured the extension of the ITC for another six years to 2022. As I will discuss in Chapter 5, these contests appear to be part of a larger war between incumbents in the fossil fuel industries and the new kids on the block in the wind and solar industries.

Business actors

Although the next chapter will draw on the existing literature to provide a theoretical basis for examining business behaviour, it is useful to say a little more here about business actors in the social sciences. First, what are business actors?[3] In the social science literature on non-state actors a general distinction is made between for-profit actors and non-profit actors. In essence, this is a distinction based on motivations. Business actors are for-profit actors and are primarily motivated by instrumental goals, normally the pursuit of profit for their owners or shareholders. Non-profit actors, on the other hand, such as environmental NGOs, are not and typically lay claim to a common good. It goes without saying that such distinctions are never perfect, and some scholars have challenged this distinction based on

instrumental motivations (Sell and Prakash, 2004). In this book the focus is on for-profit business actors, rather than on the role played by non-profit actors or by state actors, though as I will discuss in Chapter 2, to the extent that these other actors interact with business actors they are considered in the analysis. In short, the focus is on actors in the oil, gas, coal utility, solar, and wind industries

Over the last half a century scholars across the social sciences have shifted from an exclusive focus on the state to examine the role of non-state actors, including business actors. Traditionally in political science business actors have been viewed in the pluralist tradition, where corporations compete for influence just like any other interest group at the domestic or international level. This perspective has long dominated studies of US politics where scholars argued that corporate actors do not possess any advantages that are not held by other interest groups (Dahl, 1961).

However, in recent decades scholars have challenged this conventional understanding. Political scientists have turned their attention to the power of business actors and their capacity to shape policy outcomes (Schattschneider, 1960; Vogel, 1989; Culpepper, 2015). Business and management scholars have examined the political activity of firms, their non-market strategies, and the impact these have on firm performance and industry competition (Shaffer, 1995; Håkansson and Ford, 2002). Parallel work in regulation and governance, and in the tradition of public policy, has confronted the enduring consensus that governance outcomes are the product of state actors operating through formal hierarchies, to show that business actors often govern in concert with networks of state and non-state actors across multiple levels of governance and multiple policy domains (Braithwaite and Drahos, 2000; Rhodes, 2006; Sabatier, 1988).

As I will discuss in the next chapter, existing research in these fields shows that business has played a critical role shaping governance outcomes around the globe. In global environmental politics scholars have considered the complex means via which business actors have shaped environmental policy at the national, international and transnational level (see for example, Falkner, 2008; Clapp and Fuchs, 2009; Levy and Newell, 2002). Other scholars have explored these issues, for example, in relation to intellectual property (Sell, 2003; Sell and Prakash, 2004). Significantly, this literature has not yet examined the energy sector in any depth.

Cases, methods, and data

This book examines the role of business actors in the energy sector across six policy contests during the Obama administration (2009–2016). The focus is on the US because if the world is to achieve an energy transition the US will be critical given their historical influence in writing the rules that govern the globe (Braithwaite and Drahos, 2000). And, within the US the focus is on business actors in incumbent fossil fuel industries whose

political resistance must be overcome if an energy transition is to be achieved, and it is on business actors in renewable energy industries whose political support for clean energy will need to grow. Accordingly, industries engaged in the production and consumption of oil and gas are examined because, as discussed, the evidence shows that a third of the world's oil reserves and half the world's gas reserves must be left in the ground to keep global warming to 2°C. Industries engaged in the production and consumption of coal are considered for the same reason because almost 90 per cent of global coal reserves must be left untouched. And, industries that produce and consume wind and solar power are examined because most projections show that a rapid widespread deployment of these renewable technologies will be necessary to replace these fossil fuels.

In order to examine business actors, the largest firms were identified in each industry according to publicly available data. For the purposes of this study the industry is unit of analysis. In the oil and gas industries producers were identified based on annual revenues sourced from the Global Fortune 500 lists, where this was not available data was sourced from company annual reports or associated industry reports.[4] In the coal industry the largest coal producers were identified based on production data sourced from the EIA and in the utility industry data were sourced from the Edison Electric Institute (EEI), the industry association for investor-owned utilities (EIA, 2014; EEI, 2014). Finally, in the wind industry manufacturing firms were identified based on their share of the US wind power market, and in the solar industry firms were identified based on their share of the manufacturing and installation segment of the US solar market (Osten, 2015; Khedr, 2015; DoE, 2016). To be selected a firm did not need to be headquartered in the US, but it did need to have a presence in the US market. For example, Royal Dutch Shell has its headquarters in the Netherlands, but it remains an active participant in US policy debates. The same approach was taken in each of the industries.

While there is a growing trend for large-N quantitative studies in the social sciences (Gerring, 2017), they tend to lean toward examining factors that are measurable and neglect those that are more difficult to quantify, such as mapping networks of diverse actors (O'Neill *et al.*, 2013: 449). This book primarily employs a small-*n* case study approach. This was considered the most effective method for analysing the how and why of business behaviour. I used process tracing to reconstruct chronologically the behaviour of business actors in these industries, particularly their strategies, in each of the six policy contests (Bennett, 2007: 35–36; Beach and Pedersen, 2013). The six policy contests were chosen to vary across the key energy industries that the empirical evidence indicates are likely to determine the speed and scope of an energy transition in the US, as noted they are the oil, gas, coal, utilities, wind, and solar industries. As a result, it was possible to examine how preferences and strategies varied across these key industries.

At the same time, the policy contests chosen shared some fundamental characteristics that allowed a number of potential variables to be held constant, which are theoretically important for analysing the behaviour of business actors (Przeworski and Teune, 1970: 32–34). First, the policy contests all took place in the US. As a result, business actors across the policy contests all faced the same opportunities and constraints from operating in the same political system. For example, they all had the same opportunity to form coalitions with the same sets of state and non-state actors, to lobby and shape regulations. The conditions would be very different, for instance, for energy corporations operating in China or Russia. Second, each of the policy contests took place at the Federal level. Hence business actors were interacting with similar sets of policymakers in each of the contests, namely the White House, the Congress, and Federal agencies, such as the Department of Energy (DoE). In other words, policy contests at the state level or local level, such as those over renewable portfolio standards were excluded. That is not to say that business actors never looked to other venues to make their case, they did, but they did so only to the extent that it could help to shape a federal policy outcome (Klyza and Sousa, 2008). Third, the six cases all occurred during the period of the Obama administration (2009–2016). Previous research has shown that a change in administration can significantly affect the capacity of non-state actors to shape governance outcomes (Downie, 2014b). As a result, cases were selected to ensure that this variable remained constant, although there were changes in the composition of the Congress during this period, as discussed above.

Further, cases were also selected that respondents and empirical evidence indicate are significant in their own right because of the impact they are having on the US energy sector. For example, respondents in the coal industry argued that the contest over the Clean Power Plan is having significant impact on the viability of coal, likewise respondents in the solar industry argued the same about the PTC, and the evidence supports this. Finally, each of these cases were 'policy contests'. In other words, as respondents indicated, business actors in the energy sector were actively engaged in these contests during the Obama administration. This has two benefits. On the one hand, it makes it possible to identify and examine business preferences and strategies relative to other policy debates where business actors were less active. On the other, because these policy contests have a high level of visibility it also makes it easier to ascertain the domestic political incentives of policymakers at a general level given the publicly available information.

In order to examine business behaviour in each of the six policy contests semi-structured interviews were conducted with business actors. Specifically, three rounds of semi-structured interviews were conducted with senior executives and lobbyists from energy corporations and industry associations, supplemented with a small sample of policymakers and

academic experts. The first round of interviews was conducted in 2014 and was used to help identify the participants in the contests. In particular, to identify business actors that were not captured in the original sample, but that respondents claimed were important players in the policy contests despite, in some cases, their smaller size. Subsequently, two further rounds of interviews were conducted concentrating on firms engaged in these policy contests. In order to access these firms more easily I was based at the Massachusetts Institute of Technology in Cambridge, MA, in 2015. This provided not only an excellent vantage point from which to examine US energy policy, but it also enabled multiple trips to the headquarters of firms in these industries, including their political headquarters in Washington DC. In all, 76 respondents were interviewed. While interviews were conducted confidentially, most respondents agreed to be cited as representatives of their industry rather than of a specific firm or association.

To ensure construct validity, the data from the interviews were analysed in two ways. First, the data were evaluated for consistency within each policy contest. Data provided from one firm in one case were checked against the data provided by his or her colleagues in the same industry. This is especially important in elite interviewing because of the risk that respondents may exaggerate the importance of their role in events (Berry, 2002; Delaney, 2007). Second, data from the interviews were compared against documentation collected from an earlier literature review in which a firm's position or strategy in each of the policy contests were revealed. Such documentation included congressional testimony, press releases, speeches, or newspaper reports covering the firm's behaviour, or similar documentation from industry associations, which outlined the industry's position and approach (Cass, 2007; Bennett, 2007). Once this validation process was complete a rich body of empirical data was available for analysis.

Contributions of the book

This book begins from the premise that the world needs a clean energy transition and that the US is crucial to making that happen. From this starting point I argue that it is hard to imagine an energy transition occurring in the US without overcoming the political resistance of incumbent fossil fuel industries. A clear understanding of business behaviour in the energy sector therefore is a necessary first step to achieving a clean energy future. In the absence of knowing exactly how and why business actors behave in the US, government attempts to transform the energy sector are likely to be delayed, or even derailed, by the resistance of actors in the incumbent fossil fuel industries.

In taking this first step, this book makes an empirical, theoretical, and policy contribution. Before canvassing what those contributions are, it is helpful to be clear about the scope of the argument. In other words, to be

clear about what this book does not do. This book does not seek to explain policy outcomes vis-à-vis other actors, which would necessarily require consideration of a wider range of state and non-state actors. In other words, I do not claim to provide a definitive explanation for the outcome in each of the policy contests. Instead the focus is exclusively on business actors in key energy industries. That said, given that existing empirical studies have shown that business actors influence the ultimate shape of policy outcomes, I do attempt to assess the impact business actors had on each contest through an analysis of their preferences and strategies. Of course, business behaviour does not occur in a vacuum, it is shaped by the institutional environment in which it operates. Accordingly, as I explain in the next chapter, I consider two conditioning factors that are likely to be critical to the policy contests examined in this book: the mobilisation of other non-state actors and the role of policymakers.

The principal empirical contribution of this book is that it examines business actors in the energy sector, a topic that until now has been largely neglected in energy politics and environmental politics. Existing scholarship has shown that business actors are critical to addressing some of the most pressing environmental problems facing the globe, but little if any scholarship has considered the role of business actors in energy-centric industries, despite the fact that energy contributes around two-thirds of global greenhouse gas emissions. Accordingly, this book is the first to provide a fine-grained empirical analysis of these actors in contemporary policy contests in the US. As a result, it maps the key actors, coalitions, and networks, and identifies not only their preferences, but also the strategies they use to shape outcomes. In addition, because the political histories of these contemporary policy contests are yet to be examined in detail in the existing literature, the accounts provided in the following chapters make an important empirical contribution.

Second, in doing so, this analysis provides new insights about the preferences and strategies of business actors in the energy sector. First, it speaks to existing theoretical expectations about the factors that drive firm preferences, including commercial interests, and to the factors that shape how firms respond to the institutional contexts in which they are embedded. It also speaks to expectations that variations in the distributive effects of policies on business actors will lead to divergent preferences and often industry conflict. While it confirms much of the existing theory, it also suggests new insights about how business preferences are determined, especially about how business actors hedge their positions, which appears to be especially prevalent in some industries. Second, this book builds on the existing literature to offer new theoretical insights about the strategies business actors use to exert influence over the policy process. For example, in the context of coalition building, a key business strategy, the empirical evidence highlights how traditional industry associations often act as the command centre of business campaigns to pool resources and build

legitimacy. It also highlights how ad hoc coalitions emerge and are prevalent across the sector, which is often overlooked in existing studies, and it highlights the important role that coalitions can provide in building the legitimacy of emerging industries, namely renewable industries. In addition, it considers the influence business actors had on each of the policy contests, and importantly, how their opportunities to do so were affected by the role of other non-state actors and by policymakers, whose own behaviour was driven by their beliefs and political incentives.

Third, in the final chapter this book seeks to make a policy contribution by drawing together the theory and the evidence to identify specific strategies for policymakers seeking to facilitate a clean energy transition. Strategies are identified in the context of the US energy sector for policymakers concerned about implementing polices that can overcome the resistance from incumbent fossil fuel industries, and that build coalitions and networks in support of policies that promote clean energy. In doing so, it builds on recent work that explores the pathways to building winning green coalitions. Specifically, the strategies are to entrench and build existing interests via targeted sector specific policies; exploit inter-industry and intra-industry divisions with smart policies that, for example, target politically weak industries; and shift existing interests with policies that induce changes in industry investment and structure by sending direct and repeated policy signals. Further, following Donald Trump's election, strategies are also identified for business actors in emerging renewable industries, which could be employed in the absence of attempts by federal policymakers to advance an energy transition.

Guide to the book

This book is organised into three parts. The first part – Chapters 1 and 2 – introduces the transformations taking place in the US energy sector and the role of business actors therein. Chapter 2 provides a theoretical basis for examining business actors in key industries in the six policy contests outlined in this chapter. Drawing on the insights of scholars in political science, business and management, and regulation and governance, it establishes a theoretical framework for considering the power, preferences, and strategies of business actors. While the focus is on business actors, this chapter also considers conditioning factors that will impact the influence business actors can exercise, namely the mobilisation of other non-state actors and the role of policymakers.

The second part of this book is organised around critical energy sources: oil and gas (liquid fuels); coal and utilities; and wind and solar power. Each chapter – Chapters 3, 4, and 5 – considers the role of business actors in two policy contests, with a particular focus on the preferences and strategies of actors in key energy industries. Chapter 3 examines business actors in the oil and gas industries using two policy contests triggered by the shale

revolution, which has resulted in the US becoming in a matter of years the largest producer of oil and gas in the world. That is, the contest over the export of gas and the contest over the export of oil. Both provide an excellent window via which to examine business in these incumbent fossil fuel industries that have long dominated the US energy sector.

Chapter 4 turns to coal to examine business actors in the coal industry that mine the coal and in the utility industry that burn it to generate electricity. While the US continues to have the largest estimated recoverable coal reserves on the planet, demand for coal has been declining largely because the electricity sector, which consumes almost 90 per cent of US coal production, has been substituting coal for cheap gas (EIA, 2016f). In this context, President Obama's attempts to implement an emissions trading scheme, and later the Clean Power Plan, two initiatives that are directly designed to limit the exploitation of coal, have been fiercely contested by business actors in both the coal and utility industries.

Chapter 5 continues the examination of business actors, though in this chapter the focus is on business actors in the renewable energy sector. Of all the renewable sources that are commercially viable today, wind and solar have the greatest potential to transform the energy sector. In the US wind and solar power have surged in recent years precipitating a series of policy contests, particularly with the utility industry, which is directly threatened by the spread of renewable power. Two of the most hotly contested policy contests have been over the extension of the PTC and the ITC. In both cases business actors in the wind industry and the solar industry have been directly engaged, as have other business across the US energy sector.

Following an analysis of business actors in each of the policy contests, the third part of the book – Chapters 6 and 7 – draws together this empirical work to synthesise the theory and evidence and identify lessons for policymakers seeking to regulate these industries. Based on the empirical analysis, Chapter 6 distils the theoretical insights about why business actors behave the way they do, that is their preferences, and how they behave, that is, the mechanisms via which they seek to exert influence over the policy process. In doing so, it shows the importance of understanding the commercial interests of actors and their institutional environment. It also shows how energy corporations build coalitions, frame debates and coordinate lobbying activities to advance common goals. And finally, it reflects on the influence of business actors and how their opportunities to shape outcomes have been affected by the mobilisation of other non-state actors and the role of policymakers.

Chapter 7 asks the question: what should policymakers do? It identifies strategies that policymakers can employ to implement policies that can overcome the resistance from incumbent fossil fuel industries. It also offers lessons for business actors in renewable industries faced with a new political reality following the election of Donald Trump to the White House.

This chapter concludes by reflecting on the implications for future research and the implications for the climate of the energy transformations taking place in the US. It highlights that while the structural decline of the coal industry and the boom in the wind and solar industries have obvious benefits for efforts to limit global greenhouse gas emissions, the US much like the rest of the world, remains off track when it comes to the oil and gas industry.

While I have made every attempt to keep this book as slim as possible, for those short of time this book can be read in parts. Readers with a specific interests in the oil and gas sector (Chapter 3), coal and utility sector (Chapter 4) or wind and solar sector (Chapter 5), may wish to select only the relevant chapter, though I suggest those with an interest in electric utilities read both Chapters 4 and 5. For policymakers that have little interest in the theory I recommend jumping straight to Chapter 7. That said, I hope that scholars engaged in business actors and energy and environmental politics will find enough interesting material to read from the first page to the last.

Notes

1 These projections are based on current laws and regulations implemented during the Obama administration, including the Clean Power Plan, and do not take into account recent announcements by President Trump to roll back such measures.
2 US oil production figures include crude oil and natural gas liquids. Based on crude oil alone the US remains the third largest producer in the world.
3 I will use the terms business actors and corporate actors interchangeably throughout the book.
4 Details of the Fortune 500 methodology can be found here: http://fortune.com/fortune500/