



Business actors, political resistance, and strategies for policymakers

Christian Downie



School of Regulation and Global Governance (RegNet), The Australian National University, Canberra ACT 2601, Australia

ARTICLE INFO

Keywords:
 Business actors
 Environmental politics
 Policy
 United States
 Energy transition

ABSTRACT

Existing energy policies remain well short of achieving a rapid transformation to a low carbon system of energy supply. One of the principal reasons has been political resistance from incumbent fossil fuel industries. While numerous studies have demonstrated the influence of business actors across multiple policy domains, less work has examined the behaviour of business actors in individual energy-centric industries, namely the oil, gas, coal, utility and renewable industries. Accordingly, this paper examines the role of business actors in the US energy sector and asks what should policymakers do? Drawing on new empirical data, primarily semi-structured interviews with business actors across the US energy sector, this paper argues that there are specific strategies policymakers can employ to help overcome the resistance from incumbent fossil fuel industries. Specifically these are to: entrench and build existing interests via targeted sector specific policies; exploit inter-industry and intra-industry divisions; and shift existing interests with policies that induce changes in industry investment and structure.

1. Introduction

Existing energy policies remain well short of achieving the ‘energy revolution’, that the International Energy Agency (IEA) has long argued is needed to precipitate a rapid transformation to a low carbon system of energy supply (IEA, 2008). Despite the efforts of policymakers around the world, the energy sector continues to contribute around two-thirds of greenhouse gas emissions (IEA, 2015a). Eighty per cent of the world’s energy demand is met by fossil fuels and this has hardly changed in 30 years. In 2013, oil’s share was 31 per cent, coal 24 per cent and gas 21 per cent (IEA, 2015b: 57). Most projections expect this to continue, including those of the largest energy corporations in the world (ExxonMobil, 2016). Indeed even if the Paris Climate Agreement is fully implemented, the United Nations estimates that the world will remain on track to increase global average temperatures by 3.5 °C by 2100 (UNEP, 2015).

The question then is what should policymakers do? Traditionally, policymakers tend to favour measures that economists regard as efficient. In the context of energy and climate change, governments around the world have favoured policies that place a price on carbon, such as emissions trading or carbon taxes, because they are considered the most efficient way to reduce emissions (Stern, 2007). However, while emissions trading may be the most economically efficient policy, it is not always politically successful. Examples abound in North America and Europe of failed attempts to introduce carbon taxes and emissions trading, and more recent cases, such as in Australia, where

emissions trading was implemented and then repealed two years later (Crowley, 2017; Knox-Hayes, 2012).

One of the principal reasons for the succession of failures has been political resistance from incumbent fossil fuel industries. When the resistance from energy intensive industries is strong policymakers are less successful at implementing their preferred policy instruments (Hughes and Urpelainen, 2015). In this context, it is important to understand business behaviour in energy-centric industries. Numerous studies have demonstrated the influence of business actors across multiple policy domains, including in environmental politics (for a review of this literature see Clapp and Meckling (2013), Tienhaara (2014) and Tienhaara et al. (2012)). 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; Newell and Paterson, 1998; Skjaerseth and Skodvin, 2003). This is somewhat of a surprise given that business actors in the energy sector are central to the problem. Recent evidence shows that just 90 companies are responsible for two-thirds of global greenhouse gas emissions, including Chevron, ExxonMobil, BP, Shell, ConocoPhillips and Peabody Energy (Heede, 2014).

Accordingly, this paper examines the role of business actors in the US energy sector in order to draw out the lessons for policymakers. The focus is on the US because 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 (IEA, 2014). Further,

E-mail address: christian.downie@anu.edu.au.

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. This paper concentrates on six contemporary policy contests that have taken place in the US energy sector during the Obama administration (2009–2016).

Drawing on new empirical data, primarily semi-structured interviewers with business actors across the US energy sector, this paper contributes to our empirical understanding of business actors in the US energy sector and it contributes to our policy understanding of achieving an energy transition. First, given the limited scholarship on the role of business actors in energy-centric industries, the empirical analysis presented here not only helps to map the key actors, coalitions and networks in the US energy sector, but it identifies the factors that determine their preferences and the strategies they use to shape outcomes. In doing so, it highlights important inter-industry and intra-industry divisions within the US energy sector. Second, in the context of achieving an energy transition, this paper makes a policy contribution by identifying specific strategies that policymakers can employ to help overcome the resistance from incumbent fossil fuel industries. Specifically these 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.

The next section provides a brief review of the literature, the data and methods. This is followed by an examination of business behaviour across six policy contests in the US, drawing on the empirical data. The final section discusses the policy implications. In particular, it elaborates on potential strategies for policymakers to overcome opposition from fossil fuel industries, which is critical given that such opposition could delay and even derail government attempts to regulate the energy sector and achieve a clean energy revolution.

2. Background and literature review

2.1. Energy transitions and business behaviour

In order to examine the behaviour of business actors in the US energy sector and consider the lessons for policymakers this paper draws on concepts from two related bodies of literature. The first is the literature on energy transitions. A clean energy transition broadly involves a fundamental change in the energy system away from fossil fuels toward the extensive deployment of clean energy. While there is an ongoing discussion around the precise definition of an energy transition, it is widely accepted that it will be difficult and that time is running out (see for example, Sovacool (2016)). The difficulty of an energy transition results from the “carbon lock-in” that industrialised nations have experienced, which favors fossil fuels and complicates the emergence of new technologies (Unruh, 2000). And the urgency stems from the irreversible damage caused by the growth in greenhouse gas emissions, which must be limited immediately if we are to avoid the devastation of a much warmer world (IPCC, 2014).

It is also widely accepted that to achieve such a transition government industrial policy is required to accelerate the restructuring of industrialised economies toward environmental sustainability (Hess, 2014). In other words, governments must intervene because markets alone have failed to bring about a fundamental change in the energy system. However, as noted above, too often the most efficient instruments favoured by policymakers have failed to be implemented because of the political resistance from incumbent fossil fuel industries. Scholars of environmental politics and energy transitions have charted the power and influence of business actors in shaping climate policy outcomes (see for example, Akin and Urpelainen (2013), Falkner (2008), Hess (2013), Pegels and Lütkenhorst (2014), Tvinneheim and Ivarsflaten (2016)). For example, Akin and Urpelainen (2013) argue that cleaner forms of power

production are less likely when fossil fuels dominate the electricity market because of the political power and resistance of incumbent fossil fuel industries. Likewise Hess (2013) claims that because energy transitions are politically contested incumbent regimes may resist and alter the trajectory of development. Further, Hughes and Urpelainen (2015) have shown that the “political-economic clout” of industry, both the fossil fuel industry and the renewable industry, is critical to explaining the variation in energy-related climate policies implemented in industrialised countries.

In this context, it is important to understand business behaviour in energy-centric industries and to consider the insights of a second body of literature, that is, on business actors in environmental politics and related fields. A particular focus of this literature is to understand the power, preferences and strategies of business actors. Turning first to power, scholars of business actors broadly emphasise three principal dimensions of business power: instrumental power, which largely reflects the financial resources of firms; structural power which emphasises the structural position of business in society and the power it confers; and discursive power, which derives from business' capacity to frame policy contests and influence policy decisions by linking frames to specific ideas, norms and values (Barnett and Duvall, 2005; Clapp and Fuchs, 2009; Culpepper, 2015; Falkner, 2008).

In terms of preferences, this literature typically assumes that preferences are determined by two factors: interests and institutions. First, in regulatory contests, like those in the energy sector, business preferences will primarily be determined by the distributional effect of the policy. In most cases environmental regulations will have different costs and benefits for different industries and different firms within the same industry (Keohane et al., 1998). In general, firms will tend to support regulations when they benefit from them and oppose them when they do not (Falkner, 2008). Second however, preferences may also reflect the institutional environment in which business actors operate, such as the home country of a firm or its unique corporate history (Levy and Kolk, 2002; Woll, 2008).

Finally, scholars in this tradition also examine a range of strategies business actors can employ to shape policy outcomes. In this paper the focus is on three strategies that appear prevalent in the energy sector namely, mobilising coalitions, lobbying and framing, though as will be discussed these are not the only strategies employed. For example, business actors build and organise coalitions to influence policy outcomes by mobilising other business actors, state actors and non-government organisations, including environmental NGOs. They also lobby via personal contact with policymakers and via public campaigns, and they seek to frame debates to set agendas and influence policy contests (Baumgartner et al., 2009; Desombre, 1995; Kraft and Kamieniecki, 2007; Layzer, 2012; Sell and Prakash, 2004; Vogel, 1989).

In the following sections, the insights of these literatures are built upon to answer three key questions. First, why are business actors shaping policy contests in the energy sector? In other words, what are their preferences? Second, how are they shaping these contests? What are their strategies? Third, and critically given the aim of this paper, what are the implications for policymakers? Put differently, what are the lessons for policymakers seeking to regulate these industries and advance an energy transition?

2.2. Data and methods

In order to examine the behaviour of business actors in the US energy sector the largest firms were identified according to publicly available data. 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.¹ In the coal industry the largest

¹ Details of the Fortune 500 methodology can be found here: <http://fortune.com/fortune500/>

coal producers were identified based on production data sourced from the Energy Information Administration (EIA) and in the utility industry data was sourced from the Edison Electric Institute (EEI), the industry association for investor-owned utilities (EEI, 2014; EIA, 2014). Finally in the solar industry firms were identified based on their share of the manufacturing and installation segment of the US solar market (Khedr, 2015; Osten, 2015).

Process tracing was used to reconstruct the preferences and strategies of corporations in each of the six policy contests (Bennett, 2007: 35–36). The contests were selected using a ‘most-similar’ research design to allow a focus on the behaviour of business actors while keeping other variables constant, to the extent that it is possible (Przeworski and Teune, 1970: 32–34). In other words, policy contests were not selected at random to be representative of a population (Eisenhardt, 1989: 536–537; Silverman, 2001: 250–252; Yin, 2009: 54–55). Accordingly, each of the policy contests share some fundamental characteristics. First and importantly, 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 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, 2014). 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.

In addition, 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 solar industry argued that the contest over the investment tax credit had a significant impact on the viability of solar and the evidence supports this.

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 in 2015 concentrating on firms engaged in these policy contests. In all, 71 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. Following the advice of King et al. (1994: 23) on reporting and recording how the data are generated, Table 1 shows the number of interviews in each energy industry and some of the key firms in each industry based on the above data. The left hand and central columns list the key firms and most prominent coalitions during the policy contests and the right hand column lists the number of interviews per industry. Traditionally business actors have formed sectoral or industry associations. This is especially common in the US, where industry associations, such as the American Petroleum Institute (API), or sectoral wide associations, such as the National Association of Manufacturers (NAM), are important coalitions that aggregate business preferences across specific sectors, or in the case of the Chamber of Commerce (COC), across the entire business community.

3. Six policy contests in the US energy sector

Since 2009 a series of policy contests have unfolded across the US

energy sector in which business actors have played a central role. This section provides an overview of the behaviour of business actors in six contests, two each in the oil and gas industries, two in the coal and utility industries and two in the solar industries. The sub-sections are structured to provide a brief overview of each contest, including the position of policymakers, before turning to consider, why business actors took the positions they did, and second, how they worked to shape the contests. The following section focuses on the third question on the lessons for policymakers.

3.1. Policy contests in the oil and gas industries

The first set of policy contests is in the oil and gas industries where the shale revolution – the technology breakthroughs that have enabled producers in the US to access enormous onshore oil and gas reserves – has led to a rapid rise in oil and gas production in the US, which in turn triggered a series of policy contests (IEA, 2011). Two contests standout: the restrictions over gas exports and oil exports.

In the case of gas, the sharp increase in domestic production precipitated a push by gas producers to ease export restrictions. Existing restrictions made it difficult to export gas to jurisdictions with which the US had not signed a free trade agreement, such as Asia and Europe, which have higher international prices for gas (DoE, 2015). Between 2008 and 2012, as a result of the shale boom, the Henry Hub price of gas in the US fell to less than \$2 per million Btu in 2012, while international prices remained as high as \$17 per million Btu (EIA, 2011, 2016b). This sparked a bitter contest across the energy sector, especially from business actors, such as Dow Chemical, which benefited from the abundance of domestic gas supplies and did not want it exported (Dow Chemical Company, 2013).

In the case of oil a 30 per cent increase in production over the last decade, due to the shale boom, has seen the US go from being the largest oil importer to the largest oil producer surpassing both Russia and Saudi Arabia (IEA, 2014: 173). However, for 40 years the US had in place an effective ban on the export of crude oil. With 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 to overturn the ban in order to access higher prices for their products on international markets.

By 2016, both these policy contests had concluded. In the policy contest over gas exports, the Obama administration responded to growing pressure from the oil and gas industry and congressional leaders, including Republican House Speaker Boehner, by expediting the approval process for exports (Ryan, 2014). Specifically, because this was a regulatory issue that did not require congressional approval, policymakers in the Department of Energy approved the first export terminal in 2016, Cheniere Energy's Sabine Pass, and four other terminals have now been approved and are under construction (EIA, 2016a). In the debate over oil exports many Republicans in Congress supported lifting the restrictions, but Democrats did not, and neither did the White House. Within Congress the push to overturn the ban was led by US senators with close ties to the oil industry, including Republican Senator Murkowski, Chairwoman of the Senate Energy Committee and one of leading advocates for oil exports (Harder, 2014). However, it was not until December 2015 with negotiations over the Omnibus Appropriations bill that the 40 year restrictions on the export of crude oil were overturned, in return for which Democrats secured an extension of tax credits for renewable energy, discussed below (Harder and Berthelsen, 2015).

Table 2 summarises business behaviour. In answer to the first question on business preferences, it shows that in general oil and gas producers supported easing restrictions on the exports of these commodities because it was in their commercial interests. Exports would provide access to international markets and higher prices for

Table 1

Key firms, coalitions and interview data.*

	Key Firms by Industry	Prominent Energy Coalitions in Policy Contests	Number of respondents interviewed by industry or related association
Oil and Gas	Shell ExxonMobil BP Total Chevron	America's Energy Advantage (AEA); American Natural Gas Alliance (ANGA); American Petroleum Institute (API); CRUDE Coalition; Producers for American Crude Oil Exports (PACE)	14
Coal	Peabody Energy Arch Coal Alpha Natural Resources Cloud Peak Energy Rio Tinto	American Coal Council (ACC); American Coalition for Clean Coal Electricity (ACCCE); National Mining Association (NMA)	10
Utilities	Duke Energy NextEra Energy Dominion Resources Southern Company Exelon	Edison Electric Institute (EEI); Partnership for a Better Energy Future; US Climate Action Partnership (USCAP)	14
Solar	Solar World First Solar SolarCity Sunpower SunEdison	Solar Energy Industry Association (SEIA); The Alliance For Solar Choice (TASC); Tell Utilities Solar Won't be Killed (TUSK)	19

**A further 14 respondents were interviewed from other energy industries, government and academia.

* While these were the key firms and coalitions during the period of the policy contests, several of these actors no longer operate, having filed for bankruptcy, been taken over, or having disbanded in the case of coalitions.

Table 2

Summary of business behaviour in the oil and gas policy contests.

	Gas exports	Oil exports
<i>General industry preferences</i>	Oil and gas producers support Petrochemical manufacturers oppose	Oil and gas producers support Oil refiners oppose
<i>Key coalitions mobilised in the energy sector</i>	API, ANGA and AEA	API, CRUDE and PACE
<i>Key coalitions mobilised in the business community</i>	COC and NAM	COC and NAM
<i>Other important actors in the networks</i>	LNG Allies (includes Poland, Hungary, Czech Republic and Slovak Republic)	Czech Republic, Japan and South Korea
<i>Framing strategy</i>	Framed solution as free trade	Framed solution as free trade
<i>Lobbying</i>	The oil and gas industry spent more than \$140 million per year on lobbying	The oil and gas industry spent more than \$140 million per year on lobbying
<i>Outcome</i>	Restrictions on gas exports eased	Ban on crude oil exports overturned

their products. This led to inter-industry divisions as some business actors, for example, petrochemical manufacturers, such as Dow Chemical, opposed gas exports because in their view it would raise domestic gas prices, which was contrary to their interests (Interviews 10, 20, 42). It also led to intra-industry divisions as independent oil refiners, for instance, such as Philadelphia Energy Solutions, Alon USA Energy, PBF Energy and Monroe Energy, launched the CRUDE Coalition (Consumers and Refiners United for Domestic Energy) to oppose lifting the ban, arguing that unfettered exports of oil would raise their costs (Interview 4, 16, Mundy, 2014).

In answer to the second question on business strategies, it shows that business actors used a combination of coalition mobilisation, framing and lobbying. In both contests oil and gas producers mobilised key industry associations, notably the API and the American Natural Gas Alliance (ANGA) to shape the outcomes. These coalitions acted as the command centres as they worked to pool resources and coordinate activities. Some corporate actors also mobilised temporary coalitions such as America's Energy Advantage (AEA), which was set up by petrochemical manufacturers to oppose gas exports, or Producers for American Crude Oil Exports (PACE), which was set up by oil producers to advocate oil exports (Interviews 10, 16, 20). In addition, actors in

both contests leveraged other business coalitions to their campaigns, including the COC and the NAM (Interview 35, Eisenberg, 2013). And, they leveraged transnational networks to enlist state actors abroad, including government officials, such as from the Czech Republic, to support exports of oil and gas. For example, groups such as LNG Allies helped organise the Ambassador of the Czech Republic, Petr Gandalovič, to testify before Congress in support of gas exports (Interview 16, U.S. House of Representatives, 2015).

In putting oil and gas export restrictions on the agenda, producers framed the solution as free trade (Interview 8, 35, Bell, 2014). As a normative frame free trade was effective because it had appeal among other business coalitions and policymakers in Congress. Framing was supported by the strategic dissemination of information from economic studies funded by industry, which pointed to the economic benefits of freely trading oil and gas (Dempsey, 2013; USCC, 2013). The frame of free trade was also used to link issues by drawing attention to the geopolitical advantages of exporting oil and gas to US allies (API, 2014).

Many of the key coalitions that were mobilised both in support and in opposition to exports also coordinated a vast lobbying effort, including the API and ANGA. Drawing on their enormous annual

Table 3

Summary of business behaviour in the coal policy contests.

	Waxman-Markey Bill	Clean Power Plan
<i>General industry preferences</i>	Coal producers oppose Electric utilities vary according to generation portfolios	Coal producers oppose Electric utilities vary according to generation portfolios
<i>Key coalitions mobilised in the energy sector</i>	USCAP, EEI, ACC, NMA, ACCCE, API	Partnership for a Better Energy Future, EEI, ACC, NMA, ACCCE
<i>Key coalitions mobilised in the business community</i>	COC and NAM	COC and NAM
<i>Other important actors in the networks</i>	Environmental NGOs and unions	Republican Attorneys General Association
<i>Framing strategy</i>	Framed around economic costs and job losses	Framed around economic costs and job losses
<i>Lobbying</i>	The coal industry spent \$34 million on lobbying between 2009 and 2010 and the utility industry \$336 million.	The coal industry spent \$18 million on lobbying between 2014 and 2015 and the utility industry \$240 million.
<i>Outcome</i>	Emissions trading defeated	Clean Power Plan not implemented

revenues, the oil and gas industry as a whole spent more than \$140 million per year on lobbying during the years of the policy contests (CPR, 2015). Much of the effort was targeted at Congress with industry representatives engaged in hundreds of meetings with members of the House, the Senate and the White House as they pushed for Congressional hearings and ultimately regulatory change. As several respondents pointed out, “CEOs have spent lots of time on the hill” (Interview 16). The financial resources of oil and gas producers outweighed those in the petrochemical industry and refining industry, which opposed. As one respondent claimed, it was a ‘David and Goliath battle’, but these industries too spent millions seeking to shape the outcome (Interview 16).

3.2. Policy contests in the coal and utility industries

A second set of policy contests took place in the coal and utility industries. The first was the attempt by President Obama in 2009 to legislate an emissions trading scheme. The so-called Waxman-Markey Bill would set a cap on greenhouse gas emissions. The focus was on the electricity sector because more than half of the coal produced in the US is used to provide electricity (Witter, 2015: 4). While policymakers on both sides of the aisle supported the legislation, overwhelmingly support came from Democrats led by the sponsors of the bill, representatives Waxman and Markey. However, attempts to introduce a comparable bill in the Senate failed with policymakers in both parties coming under renewed lobbying pressure from business actors, leading ultimately to the defeat of the legislation in July 2010 (Hulse and Herszenhorn, 2010).

The White House led a second attempt three years later to target emissions from coal. The Clean Power Plan 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, 2013). While the Clean Power Plan did not require legislation to be enacted, Republicans in Congress overwhelmingly opposed the Plan and they were joined by Republican policymakers at the state level, including the Republican Attorneys General Association, led by then Attorney General of Oklahoma, Scott Pruitt, which worked alongside industry to oppose the regulations both in state legislatures and in the courts (Lipton, 2014). Although the plan was finalised in August 2015, 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; EPA, 2015).

Table 3 summarises business behaviour. On the question of preferences, in the coal industry the major coal producers opposed emissions trading and direct regulation because it was not in their commercial interests. In both contests coal producers stood to lose given that coal production represented almost 100 per cent of their revenues. The outlier was Rio Tinto, which was less exposed to coal. Only 8 per cent of Rio Tinto's total global revenues came from coal

production (Rio Tinto, 2010). Preferences varied more widely in the utility industry. For example, utilities that had less coal in their generation mix and growing renewable energy portfolios, such as NextEra Energy and Exelon, which both had less than 30 per cent, supported the proposed regulations (Interview 24, Point Carbon, 2009), whereas Southern Company, which was heavily reliant on coal opposed the Waxman-Markey Bill and the Clean Power Plan outright (EPA, 2014). These divisions resulted in intra-industry conflict, primarily in the contest over the Waxman-Markey bill. While the leading industry association, the EEI, supported emissions trading, other EEI members broke ranks and campaigned against their industry colleagues (Interview 14, 35).²

On the question of strategies business actors helped to mobilise key coalitions. In the contest over emissions trading the US Climate Action Partnership (USCAP), a coalition of business actors and environmental organisations played this role tying together networks in the coal, oil and gas industries, in support of the Waxman-Markey bill. Whereas the American Coalition for Clean Coal Electricity (ACCCE), which was formed in 2008 to promote clean coal, led the opposition from the coal industry and sections of the utility industry (Interview 10). The Partnership for a Better Energy Future played this role in response to the Clean Power Plan. It was established in 2014 by the COC and the NAM (Interviews 14 and 35) to lead the ‘business and industrial community in support of a unified strategy and message in response to the Administration’s greenhouse gas (GHG) regulatory agenda’ (PBEF, 2015). These coalitions in turn leveraged their diverse networks to enlist other corporate actors across the business community, such as in the oil and gas industries.

In the coal and utility industries business actors also worked to define the proposed climate regulations – the Waxman-Markey bill and the Clean Power Plan – as the problem and frame the contest around economic costs and job losses. For example, in the contest over the Waxman-Markey bill, coal producers labelled emissions trading as an economic threat highlighting the job losses that would flow from its implementation (Peabody Energy, 2014). Coal producers and utilities also spent millions on lobbying to shape the policy outcomes. Yet for the coal industry at least, the structural decline of the industry inhibited their lobbying activity in response to the Clean Power Plan, as did the more limited pathways for lobbying directed at regulations compared to legislation (EIA, 2015). For example, between 2009 and 2010 during the debate over the Waxman-Markey bill the coal industry as a whole spent \$34 million lobbying compared to \$18 million between 2014 and 2015, the period of debate over the Clean Power Plan (CPR, 2014). As one coal lobbyist argued in relation to the EPA regulations ‘coal is so strapped for cash at the moment... they are not doing anything federally’ (Interview 49).

² For a more detailed analysis of business preferences in the coal and utility industries during these policy contests see (Downie 2017).

Table 4

Summary of business behaviour in the solar policy contests.

	Investment tax credit	Net metering
<i>General industry preferences</i>	Solar industry support Utilities opposed	Solar industry support Utilities opposed
<i>Key coalitions mobilised in the energy sector</i>	SEIA and EEI	TASC, SEIA and EEI
<i>Key coalitions mobilised in the business community</i>	High technology companies e.g. Advanced Energy Economy	
<i>Other important actors in the networks</i>	TUSK, Green Tea Coalition	
<i>Framing strategy</i>	Framed contest around fairness, jobs and growth	Framed contest around freedom and independence Aggregate figures difficult to ascertain.
<i>Lobbying</i>	Both industries spent millions e.g. in the three years to 2016, the EEI marshalled around \$27 million for lobbying and SEIA around \$2.5 million	
<i>Outcome</i>	Investment tax credit extended	Outcome varied by state

However, these actors also turned to other approaches, such as the courts. Indeed coalitions of coal producers, electric utilities and industry associations often in conjunction with state governments, as noted above, such as West Virginia, filed numerous separate claims challenging the EPA's authority to regulate greenhouse gas emissions (Davenport and Hirschfeld Davis, 2015). As one insider explained, 'the vast majority [of utilities] are not suing the EPA, but that does not mean they are not pushing state governments to do so on their behalf (Interview 41 and 6). In most cases they were defeated, but they did succeed in delaying the Clean Power Plan and creating a sense of uncertainty around the regulations, which supported the campaign against them.

3.3. Policy contests in the solar and utility industries

A third set of policy contests occurred between the solar industry and the utility industry whose profits are threatened by solar. One of the most important has been the Investment Tax Credit (ITC), which reduces federal income taxes by 30 per cent for capital investments in solar systems on residential and commercial properties (SEIA, 2015). The ITC has been a boon for the industry since it was established in 2006 and is one of the reasons that the US solar industry has grown by more than \$14 billion in the last decade (Resch, 2014). While President Obama supported a further extension of the ITC, a Republican majority in Congress did not. As a result, many solar firms had given up hope that the contest could be won in early 2015, yet by the end of the year they were celebrating an unlikely victory as Congress agreed to extend the ITC to 2022 (Cardwell, 2015). The key was Republicans, as one renewable lobbyist put it, 'you had to get them on board' (Interview 1). And, on the 18th December 2015 they came on board to extend the ITC via the Omnibus Appropriations Bill, in return for lifting the ban on oil exports discussed above (Gross, 2015).

A second contest is around the rules governing the interaction of distributed generation solar with the electricity grid – so-called net metering. Under net metering, utilities compensate households and commercial premises with solar power for the electricity they generate and feed back into the grid at the retail price (MIT, 2015: 219). In other words, solar customers only pay for their net energy consumption, which makes rooftop solar more financially attractive. In the last decade net metering rules have spread rapidly and today 44 states and Washington D.C. have developed such rules, drastically increasing the use of solar power (NC Clean Energy Technology Center, 2015). The battle over these rules has manifest differently in different jurisdictions, with policymakers in many states, such as California, supporting solar companies, whereas in others, such as Arizona, solar firms have faced more hostile regulators (Cardwell, 2016).

Table 4 summarises business behaviour. Turning first to preferences, in the solar industry, the vast majority of corporations supported the extension of the ITC and the maintenance of net metering regulations because it was in their commercial interests to do so. In

pursuing their interests, inter-industry conflicts broke out with the utilities because the surge in solar power directly threatened their business model, which in turn led to 'a well-organised backlash' from the utility industry (Interview 44). However, First Solar was an outlier in the solar industry in both contests. To some extent, this likely reflected that First Solar had less to lose commercially from the abolition of these policies. For example, in the case of the ITC, there is some evidence to suggest that prior to the policy contest commencing in 2013, First Solar had made a decision to shift away from investments that are reliant on government subsidies (Sweet and Chernova, 2011). As the CEO of First Solar James Hughes stated in 2012 when describing the company's strategy: 'let's go to those places where we are... economic today with no subsidies' (Parkinson, 2012).

In pursuing their interests solar corporations relied on several strategies. First, they mobilised coalitions and leveraged a diverse network of actors in support of their campaign. In a bid to extend the ITC, the Solar Energy Industry Association (SEIA), the leading industry association, mobilised hundreds of solar firms across the country to build support for solar among Democrats and Republicans in Congress. The Alliance For Solar Choice (TASC), which was created by SolarCity and others to advocate for rooftop solar, played a similar role in the contest over net metering. In both cases these actors sought to leverage ties with other actors in the clean energy sector because they could not rely on the most powerful business associations for support, such as the COC, the NAM, or the Business Roundtable, because these associations viewed solar as an 'outlier' and sided with the incumbent industries when it came to solar subsidies (Interview 11, 21, 26).

Second, these coalitions of actors in turn attempted to frame the contests. In the case of the ITC, SEIA strategically tried to frame the debate around fairness. Relying on industry reports, solar corporations argued that not only is the extension of the ITC fair, but it will contribute growth and jobs to the US economy (Resch, 2014). In the contest over net metering, TASC and its member companies used the frames of 'freedom' and 'independence' to argue that rooftop solar provides households with the freedom to produce their own electricity and provides independence from the electricity grid (Interview 1, 45, Schwartz, 2014). This frame helped to activate conservative grassroots groups that had already emerged to advocate for solar power in Congress because as one industry executive pointed out, it 'appeals to the energy independence of conservatives' (Interview 45). These included Tell Utilities Solar Won't Be Killed (TUSK), which was set up by former Republican congressman Barry Goldwater Jr. in 2013 to fight utility efforts to stifle solar and the Green Tea Coalition, which originated out of the Atlanta Tea Party and the Sierra Club to advocate for renewable energy (Gilbert, 2014).

Finally the solar industry also lobbied, though as an emerging industry, they did not have the same financial resources as the incumbent fossil fuel industries. For instance, the revenues of the largest solar corporations, such as First Solar were in the billions, rather than the hundreds of billions in the oil and gas industry.

Nevertheless, in both contests solar corporations spent large sums lobbying. For example, in the case of the ITC SEIA as the key coalition coordinated the lobbying effort spending \$2.5 million in the three years to 2016 (CPR, 2016).

4. Conclusions and policy implications

In the US, much like the rest of the world, overcoming the resistance of incumbent fossil fuel industries will be crucial to successfully implement policies that encourage the widespread deployment of clean energy. In this context the role of business actors in energy centric industries across the six policy contests examined in the US are revealing because they highlight: the divisions within and between energy industries that can be exploited for political gain; the strategies of business resistance; and they highlight the political constituencies that can be built in support of clean energy industries.

Accordingly, the aim here is to build on the insights of the preceding analysis to identify specific strategies for policymakers seeking to build green coalitions and networks. Because, as other scholars have recognised, ‘without the support of business, widespread transformations of the economy are hard to imagine’ (Newell and Paterson, 2010: 37). In what follows, I will consider specific strategies that policymakers can undertake to build green coalitions and networks and at the same time limit resistance from incumbent industries. The analysis builds on the growing empirical evidence that positive reinforcement is crucial to building green coalitions (Kelsey, 2014; Laird and Stes, 2009; Meckling et al., 2015; Stokes, 2015). Specifically, policy choices that improve the economic competitiveness of clean energy and entrench, create and expand constituencies, such as renewable industries, who demand support for clean energy and help to drive an energy revolution (Akin and Urpelainen, 2013; Levin et al., 2012).

4.1. Entrench and build existing interests

In this context, the first strategy for policymakers is to design policies that entrench and build existing interests. Targeted sector-specific policies, such as subsidies and tax rebates, that provide concentrated benefits to firms and households, as opposed to general economy-wide policies, are more easily entrenched over time. This is because the constituencies that benefit from them tend to become politically bound to the policy, making them active supporters and defenders of it (Holland et al., 2014). Over time such constituencies may come to support stricter climate and energy regulations, making far-reaching attempts to regulate energy more likely to succeed (Meckling et al., 2015).

The policy contest over net metering provides a good illustration. Since 2005 policymakers have advanced net metering policies across the US and in many cases they have been successful at entrenching and building support for solar power. There are several reasons why. First, net metering regulations, in tandem with other policies, such as tax credits and renewable portfolio standards, have facilitated a surge in solar power in the US, entrenching the strength of the industry, which is now valued at around \$15 billion compared to \$800 million a decade ago (Resch, 2014). Second, such policies have been successful because they have reinforced an existing market trend, namely the plunging cost of solar photovoltaics, which has fallen by over 80 per cent since 2008 (MIT, 2015: 79). Third, in doing so, net metering regulations have nurtured a political constituency in support of solar power by providing a concentrated financial benefit to solar corporations and households. As industry revenues have increased so has the industry's power to defend net metering rules and advocate for clean energy regulations. This is evident in the growing lobbying presence of industry associations, such as SEIA, and the establishment of new political coalitions, such as TASC. Fourth, because the benefits of net metering increase over time and accrue not just to solar corporations,

but households too, it entrenches as well as expands support for solar power (Interview 41). This was evident in the creation of a range of industry and citizen groups, which developed to advocate and defend the regulations. In sum, targeted sector-specific policies, such as net metering, are likely to prove an effective strategy for policymakers seeking to build political support for further policy action.

4.2. Exploit industry divisions

As well as entrenching and building existing interests, policymakers should seek to exploit divisions across the energy sector. This was not done by policymakers in the contests examined here and not raised by respondents in interviews. However, when incumbent industries are divided and or politically weak green coalitions and networks will be easier to build. First, in following their commercial interests energy corporations invariably become entangled in inter-industry conflicts. These can be exploited by smart policies. If the aim is to regulate oil, for example, policies are more likely to succeed if they exploit the natural divisions between oil producers and oil refiners rather than taking on both industries together. As discussed in the contest over oil exports, independent oil refiners mobilised to oppose oil producers because of the uneven distributive impact of allowing exports. While the refiners were unsuccessful, they likely weakened the political strength of producers. Likewise, if the aim is to regulate coal the natural divisions between coal producers that mine the coal and the electric utilities that burn it to generate electricity can be leveraged in the same way. Again these inter-industry divisions were evident in both the contest over the Waxman-Markey bill and the Clean Power Plan.

Second, and related, when exploiting divisions policymakers should target politically weak industries that are less able to mount a resistance campaign. In the US the obvious example is the coal industry (Downie, 2017). The US coal industry is in structural decline, with production and revenue falling steadily (EIA, 2015). Numerous coal corporations are now on the brink of bankruptcy. Over the last 18 months three of the largest coal corporations in the US, including Peabody Energy, Alpha Natural Resources and Arch Coal have filed for bankruptcy as their share prices have plummeted (Kary et al., 2016). Coal's decline has been manifest in a shrinking lobbying presence, with key coalitions, such as ACCCE, reducing their operations, and with it the industry's capacity to resist regulations (Interview 49). In this environment, even the support of the recently elected Trump administration is unlikely to be able to reverse coal's decline, especially in the face of historically low gas prices.

Third, policymakers should also seek to exploit intra-industry divisions. One way is to target outliers. That is, corporations that form a preference opposed to the rest of the industry. For example, coal producers uniformly rounded on the Obama administration over the Waxman-Markey bill and later the Clean Power Plan. Yet in both cases Rio Tinto, a major coal producer, supported these regulatory initiatives. Policymakers who target these corporations, especially when they are powerful actors, such as Rio Tinto, may be able to bring them on board to support a policy that the rest of the industry opposes, thereby creating political cover. At the same time, encouraging outliers to withdraw from key industry coalitions will reduce the financial resources and political legitimacy of the coalition. If policymakers are fortunate the withdrawal of one significant corporation may create a cascade of departures.

4.3. Shift existing interests

Policymakers should not only seek to entrench existing interests and exploit divisions, but also to shift interests and create wider coalitions and networks. Policy signals need to induce significant changes in industry investment and structure. Policies need to send strong direct signals that will drive change, such as renewable portfolio standards that compel utilities to invest in renewable energy, which

over time can drive structural configuration within the utility industry as utilities replace coal-fired generation with renewable generation (Meckling et al., 2015). In other words, it will shift their commercial interests toward policies that support renewable energy over fossil fuels.

Policymakers also need to send repeat signals that demonstrate to corporate actors that the regulatory landscape is changing. Over time this can lead to a tipping point in an industry, when a critical mass of affected corporations shifts away from opposing a specific regulatory initiative. When proposals for new regulations first emerge on the agenda corporate actors are likely to oppose, but repeated signals from policymakers create a perception within the industry that regulation is inevitable leading them to support the regulations, or hedge their position and attempt to shape the forthcoming regulation (Vormedal, 2011). In both cases, repeat signals have the effect of limiting resistance.

This dynamic was evident in the coal and utility industries. Over the last two decades successive US administrations have instigated a series of initiatives to regulate coal. President Obama's attempt to introduce emissions trading via the Waxman-Markey bill was simply the latest attempt. For many utilities the motivation for joining USCAP, one of the key coalitions supporting the bill, was to shape the legislation because, according to one of the founders of USCAP, there was not a single USCAP CEO who did not consider future climate change regulation inevitable (Bartosiewicz and Miley, 2013: 26). The same dynamic was in play four years later with the Clean Power Plan. As executives and lobbyists in the coal and utility industries repeatedly pointed out, the successive attempts at regulation, whether successful or not, 'have created a market psychology that coal is never coming back, and that is the most important impact... the feeling is that there is no future for coal' (Interview 49). The result was that some corporations began to limit their resistance as they looked to re-structure their business models for a new regulatory environment.

4.4. Limiting resistance

Policymakers not only need to build coalitions that can overcome the resistance from incumbent fossil fuels industries, but they also need to pursue policies that limit resistance. As other scholars have pointed out, incumbent industries in the US will mobilise against clean energy policies that threaten their short-term profitability and long-term existence (Hess, 2014: 279). Indeed there is a greater tendency to do so in adversarial political systems like the US, than in more cooperative systems like Europe (Kagan, 2007). Consequently, policymakers will need to identify and design policies that limit resistance.

First, policies should seek to limit negative feedbacks. The most obvious way is to eliminate policies that build and entrench existing fossil fuel interests. Fossil fuel subsidies are a case in point. The OECD estimates that governments around the world spend an estimated \$160-\$200 billion per year subsidising fossil fuels (OECD, 2015).³ Attempts to eliminate subsidies are likely to succeed when they take advantage of existing market conditions. For instance, the plunge in the global price of oil and gas presents a unique opportunity for policymakers to abolish support for the consumption of these fossil fuels. At the same time, policymakers should resist pressure to support oil and gas corporations in their exploration and production activities in the face of falling revenues associated with the fall in prices.

Second, policymakers need to design policies that limit the avenues of resistance. This will be especially important when policymakers are attempting to build and entrench existing interests. In other words, when coalitions in support of clean energy policies are weak and incumbent fossil fuel industries resisting are comparatively strong. For example, coal producers conceded that it was easier to lobby against

the Waxman-Markey bill, than the Clean Power Plan, because there are more potential veto points on legislation that has to pass through Congress than regulations, which do not. As one executive explained, 'there are more avenues to lobby on a bill, but there is much less on a regulation because you can only lobby the administration' (Interview 14). In this context, non-legislative avenues may prove easier to pursue than legislative avenues to the extent that they limit potential veto points. This is likely why policymakers in the Obama administration followed this path with the Clean Power Plan after the failure of the Waxman-Markey bill. Previous research has pointed to executive orders, the courts and voter referenda as potential pathways to achieve environmental outcomes in the face of US Congressional gridlock (Klyza and Sousa, 2008).

In summary, implementing policies that promote clean energy, as history has shown, will not be easy. Indeed they are unlikely to succeed in the absence of green coalitions that can overcome the resistance of incumbent fossil fuel industries. In this context, the insights of the empirical analysis of business actors in the US energy sector, suggest specific strategies for policymakers. First, entrench and build existing interests in support of clean energy policy via targeted sector specific policies, such as net metering. Second, exploit inter-industry divisions with smart policies that ideally target politically weak industries that are less able to mount a resistance campaign, and exploit intra-industry divisions by seeking to bring on board outliers that support policies that the rest of an industry opposes. Third, shift existing interests with policies that induce changes in industry investment and structure, such as renewable energy targets. Policies signals not only need to be direct, but they need to be repeated to create the impression that reform is inevitable. Further, such policies will work best when they are designed in such ways that limit the avenues for resistance.

Future research should consider how these strategies would apply outside the US. While they are likely to be readily applicable in other jurisdictions with similar political systems, such as Australia, Canada and the United Kingdom, there will be differences. For example, Europe has very different governmental structures and legal traditions than the US, which may mean that in some cases adversarial strategies are less appropriate (Kagan, 2007). Similarly, the strategies identified in this paper are likely to be less applicable in nations with dramatically different political systems, such as China and Russia. Understanding these differences is important, especially given that these nations represent some of the largest producers and consumers of energy in the world.

Acknowledgements

I am grateful to the participants who kindly agreed to be interviewed for this project, and to the editors and anonymous reviewers for their insightful comments. I would also like to thank Peter Drahos who jointly conducted a number of these interviews.

References

- Adler, J., 2016. Supreme Court puts the brakes on the EPA's Clean Power Plan, The Washington Post. (https://www.washingtonpost.com/news/volokh-conspiracy/wp/2016/02/09/supreme-court-puts-the-brakes-on-the-epas-clean-power-plan/?utm_term=.239b78f63aac), 6 February.
- Aklin, M., Urpelainen, J., 2013. Political competition, path dependence, and the strategy of sustainable energy transitions. *Am. J. Political Sci.* 57, 643–658.
- API, 2014. Erik Milito's Remarks at Press Briefing on LNG Exports to U.S. Allies. American Petroleum Institute, (<http://www.api.org/news-and-media/testimony-speeches/2014/erik-milito-press-briefing-on-lng-exports-to-us-allies>).
- Barnett, M., Duvall, R. (Eds.), 2005. Power in Global Governance. Cambridge University Press, Cambridge.
- Bartosiewicz, P., Miley, M., 2013. The Too Polite Revolution; why the recent campaign to pass comprehensive climate legislation in the United States failed. Columbia University, New York.
- Baumgartner, F.R., Berry, J.M., Hojnacki, M., Kimball, D., Leech, B., 2009. Lobbying and Policy Change: Who Wins, Who Loses, and Why. University of Chicago Press, Chicago.
- Bell, J., 2014. The time has come to lift the oil export ban. Independent Petroleum

³ The figures are for OECD countries, plus six partner countries namely, Brazil, China, India, Indonesia, Russia and South Africa.

- Association of America, (<http://www.ipaa.org/2014/01/10/the-time-has-come-to-lift-the-oil-export-ban/>).
- Bennett, A., 2007. Case study methods: design, use, and comparative advantages. In: Sprinz, D., Wolinsky-Nahmias, Y. (Eds.), *Models, Numbers & Cases: Methods for Studying International Relations*. The University of Michigan Press, Ann Arbor.
- Cardwell, D., 2015. Proposed Extension of Tax Credits for Renewable Energy Would Have Uneven Effect, The New York Times, December 17, 2015.
- Cardwell, D., 2016. California Votes to Retain System That Pays Solar Users Retail Rate for Excess Power, The New York Times, January 28, 2016.
- Clapp, J., Fuchs, D., 2009. Agrifood Corporations, Global Governance, and Sustainability: a framework for analysis. In: Clapp, J., Fuchs, D. (Eds.), *Corporate Power in Global Agrifood Governance*. MIT Press, Cambridge, 1–25.
- Clapp, J., Meckling, J., 2013. Business as a global actor. In: Falkner, R. (Ed.), *The Handbook of Global Climate and Environmental Policy*. John Wiley & Sons, West Sussex, 286–303.
- CPR, 2014. Coal Mining: Lobbying, 2014. Center for Responsive Politics.
- CPR, 2015. Oil & Gas: Industry Profile: Summary, 2015. Center for Responsive Politics.
- CPR, 2016. Solar Energy Industries Assn: Spending by cycle. Center for Responsive Politics.
- Crowley, K., 2017. Up and down with climate politics 2013–2016: the repeal of carbon pricing in Australia. Wiley Interdisciplinary Reviews: Climate Change, e458-n/a.
- Culpepper, P.D., 2015. Structural power and political science in the post-crisis era. *Bus. Polit.* 17, 391–409.
- Davenport, C., Hirschfeld Davis, J., 2015. Move to Fight Obama's Climate Plan Started Early, The New York Times. August 3, 2015, New York.
- Dempsey, L., 2013. Banning LNG Exports Will Hurt Jobs and Economy. National Association of Manufacturers, (<http://www.shopfloor.org/2013/01/banning-lng-exports-will-hurt-jobs-and-economy/27328/>).
- Desombre, E.R., 1995. Baptists and bootleggers for the environment: the origins of United States Unilateral Sanctions. *J. Environ. Dev.* 4, 53–75.
- DoE, 2015. Natural Gas Regulation. Department of Energy, (<http://energy.gov/fe/services/natural-gas-regulation>).
- Dow Chemical Company, 2013. Statement for the Record to the Senate Energy and Natural Resources Committee Hearing on Opportunities and Challenges for Natural Gas.
- Downie, C., 2014. Transnational actors in environmental politics: strategies and influence in long negotiations. *Environ. Polit.* 23, 376–394.
- Downie, C., 2017. Fighting for King Coal's Crown: Business Actors in the US Coal and Utility Industries. *Glob. Environ. Politics* 17, 21–39.
- EEI, 2014. Stock Performance: Q4 2014 Financial Update. Quarterly Report of the U.S. Shareholder-Owned Electric Utility Industry. Edison Electric Institute.
- EIA, 2011. Global Natural Gas Prices Vary Considerably. U.S. Energy Information Administration, Washington D.C..
- EIA, 2014. Major U.S. Coal Producers, 2014. Energy Information Administration, Washington D.C..
- EIA, 2015. Annual Coal Report 2013. Energy Information Administration, Washington D.C.
- EIA, 2016a. Growth in Domestic Natural Gas Production Leads to Development of LNG Export Terminals. U.S. Energy Information Administration, Washington D.C..
- EIA, 2016b. Henry Hub Natural Gas Spot Price. U.S. Energy Information Administration, Washington D.C..
- Eisenberg, R., 2013. Comments of the National Association of Manufacturers on the 2012 LNG Export Study. National Association of Manufacturers, (http://www.fossil-energy.gov/programs/gasregulation/authorizations/export_study/ross_eisenberg_em01_24_13.pdf).
- Eisenhardt, K., 1989. Building theories from case study research. *Acad. Manag. Rev.* 14, 532–550.
- EPA, 2014. Comments of Southern Company. Environmental Protection Agency. (<https://www.regulations.gov/index.jsp?documentDetail;D=EPA-HQ-OAR-2013-0602-22907>), Washington, D.C.
- EPA, 2015. Clean Power Plan Final Rule, Environmental Protection Agency, (<http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf>), Washington D.C.
- ExxonMobil, 2016. The Outlook for Energy: A View to 2040, (<http://cdn.exxonmobil.com/~/media/global/files/outlook-for-energy/2016/2016-outlook-for-energy.pdf>).
- Falkner, R., 2008. Business Power and Conflict in International Environmental Politics. Palgrave Macmillan, New York.
- GAO, 2014. Changing crude oil markets: Allowing exports could reduce consumer fuel prices, and the size of the strategic reserves should be reexamined. United States Government Accountability Office.
- Gilbert, K., 2014. Could a GOP Congress back renewable energy?, Institutional Investor, (<http://www.institutionalinvestor.com/article/3413224/banking-and-capital-markets-corporations/could-a-gop-congress-back-renewable-energy.html>. VYeqPjCqpBe).
- Gross, D., 2015. It's a Wonderful Life for the Solar Industry Right Now, Grist, (<http://grist.org/climate-energy/its-a-wonderful-life-for-the-solar-industry-right-now/>).
- Harder, A., 2014. Oil producers to pump up lobbying to remove U.S. export ban. Wall Str. J., (<http://www.wsj.com/articles/oil-producers-to-pump-up-lobbying-to-remove-u-s-export-ban-1408920280>).
- Harder, A., Berthelsen, C., 2015. End of oil-export ban provides blueprint for Bipartisan compromise. Wall Str. J. (<http://www.wsj.com/articles/end-of-oil-export-ban-provides-blueprint-for-bipartisan-compromise-1450521004>).
- Heede, R., 2014. Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010. *Clim. Change* 122, 229–241.
- Hess, D.J., 2013. Industrial fields and countervailing power: the transformation of distributed solar energy in the United States. *Glob. Environ. Change* 23, 847–855.
- Hess, D.J., 2014. Sustainability transitions: a political coalition perspective. *Res. Policy* 43, 278–283.
- Holland, S.P., Hughes, J.E., Knittel, C.R., Parker, N.C., 2014. Some inconvenient truths about climate change policy: the distributional impacts of transportation policies. *Rev. Econ. Stat.* 97, 1052–1069.
- Hughes, L., Urpelainen, J., 2015. Interests, institutions, and climate policy: explaining the choice of policy instruments for the energy sector. *Environ. Sci. Policy* 54, 52–63.
- Hulse, C., Herszenhorn, D.M., 2010. Democrats call off climate bill effort, The New York Times, 22 July 2010.
- IEA, 2008. *World Energy Outlook 2008*. International Energy Agency, Paris.
- IEA, 2011. Are We Entering a Golden Age of Gas? Special Report. International Energy Agency, Paris.
- IEA, 2014. *Energy Policies of IEA Countries: the United States 2014 Review*. International Energy Agency, Paris.
- IEA, 2015a. Energy and Climate Change. International Energy Agency, Paris.
- IEA, 2015b. *World Energy Outlook 2015*. International Energy Agency, Paris.
- IPCC, 2014. Summary for policymakers. In: Field, C.B.B., V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R., White, L.L. (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, USA.
- Kagan, R.A., 2007. Globalization and legal change: The “Americanization” of European law? *Regul. Gov.* 1, 99–120.
- Kary, T., Loh, T., Polson, J., 2016. Coal Slump Sends Mining Giant Peabody Energy Into Bankruptcy, Bloomberg, (<http://www.bloomberg.com/news/articles/2016-04-13/peabody-majority-of-its-u-s-entities-file-for-chapter-11>).
- Kelsey, S., 2014. The Green Spiral: Policy-Industry Feedback and the Success of International Environmental Negotiation (Ph.D. Thesis). University of California, Berkeley.
- Keohane, N., Revesz, R., Stavins, R., 1998. The Choice of Regulatory Instruments in Environmental Policy. *Harv. Environ. Law Rev.* 22, 313–367.
- Khedr, O., 2015. IBIS World Industry Report OD4494: Solar Panel Installation in the US. IBIS World, Melbourne.
- King, G., Keohane, R.O., Verba, S., 1994. Designing Social Inquiry: Scientific Inference in Qualitative Research. Princeton University Press, Princeton.
- Klyza, C., Sousa, D., 2008. *American Environmental Policy, 1990–2006: Beyond Gridlock*. The MIT Press, Cambridge, 1990–2006.
- Knox-Hayes, J., 2012. Negotiating climate legislation: policy path dependence and coalition stabilization. *Regul. Gov.* 6, 545–567.
- Kraft, M., Kamienieczi, S., 2007. Analyzing the role of business in environmental policy. In: Kraft, M., Kamienieczi, S. (Eds.), *Business and Environmental Policy: Corporate Interests in the American Political System*. MIT Press, Cambridge, 3–31.
- Laird, F.N., Stefes, C., 2009. The diverging paths of German and United States policies for renewable energy: sources of difference. *Energy Policy* 37, 2619–2629.
- Layzer, J., 2012. Open for Business: Conservatives' Opposition to Environmental Regulation. MIT Press, Cambridge.
- Levin, K., Cashore, B., Bernstein, S., Auld, G., 2012. Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. *Policy Sci.* 45, 123–152.
- Levy, D., Kolk, A., 2002. Strategic responses to global climate change: conflicting pressures on multinationals in the oil industry. *Bus. Polit.* 4, 275–300.
- Lipton, E., 2014. Energy Firms in Secretive Alliance with Attorneys General, The New York Times. December 6, New York.
- Meckling, J., 2011. *Carbon Coalitions: Business, Climate Politics, and the Rise of Emissions Trading*. The MIT Press, Cambridge.
- Meckling, J., Kelsey, N., Biber, E., Zysman, J., 2015. Winning coalitions for climate policy. *Science* 349, 1170–1171.
- MIT, 2015. *The Future of Solar Energy*. Massachusetts Institute of Technology, Cambridge.
- Mundy, A., 2014. Refiners form coalition to fight exports of crude oil. *Wall Str. J.* (<http://blogs.wsj.com/washwire/2014/03/12/refiners-form-coalition-to-fight-exports-of-crude-oil/>).
- NC Clean Energy Technology Center, 2015. The 50 states of solar: a quarterly look at America's fast-evolving distributed solar policy and regulatory conversation, (http://nccleantech.ncsu.edu/wp-content/uploads/The-50-States-of-Solar_FINAL.pdf).
- Newell, P., Paterson, M., 1998. A climate for business: global warming, the state and capital. *Rev. Int. Political Econ.* 5, 679–703.
- Newell, P., Paterson, M., 2010. *Climate Capitalism: Global Warming and the Transformation of the Global Economy*. Cambridge University Press, Cambridge.
- OECD, 2015. *OECD Companion to the Inventory of Support Measures for Fossil Fuels*. OECD Publishing, Paris, 2015.
- Osten, M., 2015. IBIS World Industry Report 33441c: Solar Panel Manufacturing in the US. IBIS World, Melbourne.
- Parkinson, G., 2012. Interview: First Solar CEO James Hughes, (<http://reneweconomy.com.au/2012/interview-first-solar-ceo-james-hughes-72086>).
- PBEG, 2015. Reliable and Affordable Energy. Partnership for a Better Energy Future, (<http://www.betterenergyfuture.org/>).
- Peabody Energy, 2014. EPA Carbon Rules: Why Americans Should Engage(<http://www.peabodyenergy.com/content/494/coal-in-the-united-states/epa-carbon-rules>).
- Pegels, A., Lütkenhorst, W., 2014. Is Germany's energy transition a case of successful green industrial policy? Contrasting wind and solar PV. *Energy Policy* 74, 522–534.
- Point Carbon, 2009. Carbon Exposure: Winners and Losers in a US Carbon Market. Point Carbon Research, November 2.
- Przeworski, A., Teune, H., 1970. *The Logic of Comparative Social Inquiry*. Wiley-

- Interscience, New York.
- Resch, R., 2014. Rhone Resch opening remarks at SPI 2014, Solar Energy Industries Association, (<http://www.seia.org/news/rhone-resch-opening-remarks-spi-2014>).
- Tinto, Rio, 2010. Annual Report, (http://www.riotinto.com/documents/Investors/RioTinto_Annual_report_2010.pdf).
- Ryan, P., 2014. In Response to Russian Aggression, Key Central European Nations Plead for U.S. Natural Gas Exports, (<http://www.speaker.gov/press-release/response-russian-aggression-key-central-european-nations-plead-us-natural-gas-exports>).
- Schwartz, J., 2014. Fissures in G.O.P. as some conservatives embrace renewable energy, The New York Times, 26 January 2014.
- SEIA, 2015. Solar investment tax credit (ITC). Solar Energy Industries Association, (<http://www.seia.org/policy/finance-tax/solar-investment-tax-credit>).
- Sell, S., Prakash, A., 2004. Using ideas strategically: the contest between business and NGO networks in intellectual property rights. *Int. Stud. Q.* 48, 143–175.
- Silverman, D., 2001. Interpreting Qualitative Data: Methods, for Analysing Talk, Text and Interaction. Sage Publications, London.
- Skjaerseth, J.B., Skodovin, T., 2003. Climate Change and the Oil Industry: Common Problem, Varying Strategies. Manchester University Press, Manchester.
- Sovacool, B.K., 2016. How long will it take? Conceptualizing the temporal dynamics of energy transitions. *Energy Res. Soc. Sci.* 13, 202–215.
- Stern, N., 2007. The Economics of Climate Change: the Stern Review. Cambridge University Press, Cambridge.
- Stokes, L., 2015. Power Politics: Renewable Energy Policy Change in US States (Ph.D. thesis). MIT, Cambridge.
- Sweet, C., Chernova, Y., 2011. First Solar Revamps Amid Weak Market, Wall Str. J. (<http://www.wsj.com/articles/SB10001424052970203518404577097540383138700>), Washington D.C.
- The White House, 2013. Presidential Memorandum: Power Sector Carbon Pollution Standards. Office fo the Press Secretary, Washington D.C..
- Tienhaara, K., 2014. Business: corporate and industrial influence. In: Harris, P. (Ed.), *Handbook of Global Environmental Politics*. Routledge, London, 164–175.
- Tienhaara, K., Orsini, A., Falkner, R., 2012. Global corporations. In: Biermann, F., Pattberg, P. (Eds.), *Global Environmental Governance Reconsidered*. The MIT Press, Cambridge.
- Tvinnereim, E., Ivarsflaten, E., 2016. Fossil fuels, employment, and support for climate policies. *Energy Policy* 96, 364–371.
- U.S. House of Representatives, 2015. Testimony of Petr Čáslavský, Ambassador of the Czech Republic to the United States, before the U.S. House of Representatives Energy & Commerce Committee, Subcommittee on Energy & Power.
- UNEP, 2015. The Emissions Gap Report 2015: A UNEP Synthesis Report. United Nations Environment Programme, (http://uneplive.org/media/docs/theme/13_EGR_2015_Technical_Report_final_version.pdf).
- Unruh, G.C., 2000. Understanding carbon lock-in. *Energy Policy* 28, 817–830.
- USCC, 2013. State of American Business, Remarks by Thomas J. Donohue President and CEO, U.S. Chamber of Commerce. U.S. Chamber of Commerce, (<https://www.uschamber.com/speech/state-american-business-remarks-thomas-j-donohue-president-and-ceo-us-chamber-commerce>).
- Vogel, D., 1989. *Fluctuating Fortunes*. Basic Books, New York.
- Vormedal, I., 2011. From foe to friend? Business, the tipping point and U.S. climate politics. *Bus. Polit.* 13, 1–29.
- Witter, D., 2015. IBIS World Industry Report: Coal mining in the US. IBIS World, Melbourne.
- Woll, C., 2008. *Firm Interests: How Governments Shape Business Lobbying on Global Trade*. Cornell University Press, Ithaca.
- Yin, R., 2009. *Case Study Research Design and Methods* Fourth ed. Sage Publications, London.