

Manuscript version: Author's Accepted Manuscript

The version presented in WRAP is the author's accepted manuscript and may differ from the published version or Version of Record.

Persistent WRAP URL:

<http://wrap.warwick.ac.uk/93826>

How to cite:

Please refer to published version for the most recent bibliographic citation information. If a published version is known of, the repository item page linked to above, will contain details on accessing it.

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions.

Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Publisher's statement:

Please refer to the repository item page, publisher's statement section, for further information.

For more information, please contact the WRAP Team at: wrap@warwick.ac.uk.

Title: Constraining or enabling green capability development? How policy uncertainty affects organizational responses to flexible environmental regulations

Author names and affiliations:

Preston Teeter¹ (corresponding author), Jörgen Sandberg²

¹School of Business, University of Queensland, St Lucia Campus, Brisbane, QLD 4067, Australia

Email: p.teeter@business.uq.edu.au

Telephone: +61 07 3346 8100

²School of Business, University of Queensland, St Lucia Campus, Brisbane, QLD 4067, Australia,

Email: j.sandberg@business.uq.edu.au

Telephone: +61 07 3346 8065

**CONSTRAINING OR ENABLING GREEN CAPABILITY DEVELOPMENT?
HOW POLICY UNCERTAINTY AFFECTS ORGANIZATIONAL RESPONSES TO
FLEXIBLE ENVIRONMENTAL REGULATIONS**

ABSTRACT

Despite their growing popularity, flexible environmental regulations are increasingly characterized by high levels of policy uncertainty. This uncertainty poses numerous challenges for managers, policy makers, and researchers, for we still have a poor understanding of how such uncertainty affects organizational responses and the ability of organizations to generate unique capabilities. This article presents findings of a qualitative study of how organizations respond to the introduction of flexible environmental regulations amidst extremely high levels of policy uncertainty. Through an investigation of Australia's complex, and ultimately brief, carbon pricing scheme, we find that policy uncertainty forces organizations to focus their responses on short-term investments and dealing with that very uncertainty, thereby precluding the development of green capabilities and preventing flexible regulations from achieving their intended policy results. However, we also find that organizations are able to develop innovative regulatory coping capabilities and that variation in regulatory response results in a variation in these capabilities.

Keywords: environmental management, environmental regulations, green capabilities, policy uncertainty

INTRODUCTION

Flexible regulations, those in which a central authority sets a policy target and then grants organizations freedom in finding the lowest-cost method of meeting that target, are increasingly being used to tackle some of the most serious environmental problems of our time, including climate change, acid rain, and solid waste pollution. However, despite their growing popularity, flexible environmental regulations across the globe have suffered from high levels of policy uncertainty.

Of primary concern, policy uncertainty has beset numerous national and subnational regulations on carbon emissions, resulting in seesawing carbon policies in Australia, Canada, China, the E.U., India, Japan, New Zealand, and the United States (Engau and Hoffmann, 2011b; Pinkse and Kolk, 2010; World Bank, 2014) and a growing body of literature questioning the efficacy of and motives behind flexible carbon trading schemes (e.g., Böhm, Misoczky and Moog, 2012; Levy and Egan, 2003; Lohmann 2009; Pellizzoni, 2011). The uncertainty over these regulations poses numerous challenges for managers, policy makers, and researchers, for we have a very poor understanding of how such uncertainty affects organizational responses to flexible regulations (Engau and Hoffmann, 2011b).

Theoretically, there are competing views on how organizations respond to flexible regulations under policy uncertainty. On the one hand, the often-cited Porter Hypothesis argues that uncertainty prevents flexible regulations from stimulating investment and the development of green capabilities (Crotty and Smith, 2006; Porter, 1991; Porter and van der Linde, 1995). Conversely, resource-based view (RBV) scholars argue that policy uncertainty increases the motivation and opportunities for environmental proactivity and capability development (e.g., Aragón-Correa and Sharma, 2003; Carrera *et al.*, 2003; López-Gamero, Molina-Azorín and Claver-Cortés, 2011). Empirical evidence is slowly emerging but currently only offers a fragmented and mixed assortment of results, with few studies being able to isolate the effects of policy uncertainty.

In response to this lack of understanding and to test competing explanations, this study offers a unique investigation into Australia's short-lived carbon pricing scheme of 2012 to 2014. As Australia's scheme contained unprecedented coverage, flexibility, and uncertainty, our study is able to offer a rich and focused look at how policy uncertainty affects organizational response and capability

development. This paper thus contributes to the growing literature on “green management” issues, which includes an increasing focus on functional management specializations such as green supply chain management (e.g., Srivastava, 2007) and green human resource management (e.g., Renwick, Redman and Maguire, 2013; Wagner, 2013). Our contribution here lies in the management of green policies and environmental regulations.

FLEXIBLE ENVIRONMENTAL REGULATIONS, COMPETITIVE ADVANTAGE, AND POLICY UNCERTAINTY

In contrast to command-and-control environmental regulations such as best available technology (BAT) standards and government subsidies, flexible environmental regulations set a specific policy target and then allow organizations to decide how to best meet that target, usually by engaging in the trade of permits. The design of flexible regulations is based on economic theories developed by scholars such as Ronald Coase (1960) and John Dales (1968), who argued that ownership rights and bargaining would result in the most efficient distribution of resources and rapid technological advances.

Soon after the inception of these regulations, Michael Porter (1991) and Claas van der Linde (Porter and van der Linde, 1995) offered further theoretical support for their implementation by arguing that environmental regulations that adopt flexible approaches and focus on outcomes, not technologies, trigger innovation in organizations that can not only offset the cost of compliance but also lead to absolute advantage over firms in foreign countries (see also Hoppmann *et al.*, 2013; Lim and Prakash, 2014). This theory is commonly referred to as the Porter Hypothesis amongst environmental scholars. The latter part of the Porter Hypothesis rests on the assumption that domestic regulations can correctly anticipate international trends, thus enabling domestic firms to develop “internationally transferable green capabilities” (Rugman and Verbeke, 2000). Building on this theory, scholars have proposed that proactive firms that quickly adapt to new regulations can even gain a first-mover advantage in their domestic market through the development of localized capabilities (Loader and Hobbs, 1999; Rugman and Verbeke, 2000). Taken together, these

propositions suggest that flexible environmental policies constitute a true win-win scenario in which both the environment and regulated organizations benefit.

However, a somewhat unsettling trend is the increasing degree of policy uncertainty surrounding the adoption and implementation of flexible environmental regulations. The origins of policy uncertainty concerning these regulations are numerous, including factors such as the intense lobbying and public opinion campaigns of fossil fuel industries and their think-tank offspring, the potential (or alleged) costs of such regulations to both consumers and economic development, and the highly complex and historically contested science behind environmental issues such as climate change (see, e.g., Kolk and Pinkse, 2007; Levy and Egan, 2003; Pellizzoni, 2011). As a result, flexible environmental regulations have remained in a dynamic state of stakeholder contestation over the past two decades, with vested interests on opposite sides of the political spectrum playing an active role in the construction (and at times destruction) of these policies.

Ultimately, this uncertainty can take on two broad forms. First, there can be uncertainty over the technical components of the legislation, such as its detailed rules, measurements, and implementation procedures, and second, there can be uncertainty over the political (including public) support for the legislation, which ultimately translates into uncertainty over the actual passage or continuation of the legislation. According to the Porter Hypothesis, these forms of uncertainty should have a deleterious effect on the eventual outcomes of flexible regulations (see also Crotty and Smith, 2006; Majumdar, 1997). Without certainty, organizations would be “spending years attempting to delay or relax [the regulations]” and merely “adopt[ing] incremental solutions” as opposed to investing in radical innovations (Porter and van der Linde, 1995, p. 113). Thus, according to this view, policy uncertainty would prevent flexible regulations from stimulating the development of green capabilities and competitive advantage.

However, as documented by Hoffmann, Trautmann, and Hemprecht (2009, p. 1231), numerous scholars have questioned whether policy uncertainty actually does postpone investment in green technologies, with some academics supporting a more radical view that policy uncertainty may actually incentivize investment in green technologies. This position is largely rooted in the resource-based view (RBV) (Barney, 1991; Bloodgood, 2014; Wernerfelt, 1984) of environmental

management and performance. Similar to the Porter Hypothesis, under the RBV, organizations with innovative environmental strategies can develop firm-specific resources and capabilities, which can then become a source of competitive advantage (Hart, 1997; Shrivastava, 1995). However, the theories differ in that the RBV proposes that organizations must go “beyond compliance” (Aragón-Correa *et al.*, 2008; Sharma, 2000) and adopt proactive environmental strategies that both anticipate future regulations and engage in voluntary practices that help to differentiate their products and respond to evolving stakeholder demands (Kock, Santalo and Diestre, 2012; Kolk and Pinkse, 2008; López-Gamero and Molina-Azorín, 2015).

In other words, the RBV does not see regulatory design or stability as necessary for capability development, but rather the theory views organizational proactivity and voluntary initiatives as the source of competitive advantage. Resting on these assumptions, some environmental scholars argue that high uncertainty increases the motivation and opportunities for managers to develop a proactive environmental strategy as they attempt to anticipate unpredictable events (Aragón-Correa and Sharma, 2003; Carrera *et al.*, 2003; Rueda-Manzanares, Aragón-Correa and Sharma, 2007). Put conversely, under low uncertainty, most organizations would respond to regulations with similar actions and investments, thereby decreasing the chances of obtaining competitive advantage (López-Gamero, Molina-Azorín and Claver-Cortés, 2011).

So how do organizations respond to flexible environmental regulations under high uncertainty? Empirical evidence is slowly emerging on this topic but currently only offers a fragmented and mixed assortment of results. For example, studies on responses to the E.U.’s emissions trading scheme (ETS), which since its conception has been characterized by relatively high levels of technical and political uncertainty (Akter *et al.*, 2009; Engau and Hoffmann, 2011a), offer conflicting results. Some studies conclude that organizations responded rather informally with limited evidence of any radical, large-scale changes in operations (e.g., Borghesi, Cainelli and Mazzanti, 2015; Brewer, 2005; Cadez and Czerny, 2010; Hoffmann, 2007; Pinkse and Kolk, 2010). Many scholars contend that studies such as these are further proof that flexible regulations are merely a disguised form of “regulatory capture” of environmental issues such as climate change. In short, these scholars argue that fossil fuel industries and their supporters have succeeded in promoting a neoliberal, free market ideology as a

solution for large-scale environmental issues (see, e.g., Böhm, Misoczky and Moog, 2012; Levy and Egan, 2003; Lohmann, 2009; Pellizzoni, 2011). Consequently, the argument goes, they have also succeeded in creating additional opportunities for profit creation and transfer of wealth from undeveloped nations and the lower classes to developed nations and elite groups within developing nations—all the while effectively shirking responsibility for mitigation and abatement activities.

However, other studies on the E.U.'s scheme found that organizations did in fact continue to invest and innovate despite high levels of uncertainty (e.g., Delarue, Voorspools and D'haeseleer, 2008; Engels, Knoll and Huth, 2008; Hoffmann, Trautmann and Hamprecht, 2009; Okereke and Russel, 2010). Research on the effects of policy uncertainty outside the E.U.'s ETS remain sparse, with an exception being Wossink and Gardebroek's (2006) study on the Dutch phosphate quota program, in which they argued that uncertainty resulted in trade inaction.

Reaching any general conclusions from these studies is difficult for a number of reasons. First, as mentioned, the effects of policy uncertainty on flexible regulations is a relatively new phenomenon, and thus relevant research suffers from a dearth of the number of studies and the variety of research contexts. Even most of the above-mentioned studies on the E.U.'s scheme only indirectly comment on the effects of policy uncertainty and thus offer very few, if any, theoretical conclusions on those effects. Second, the majority of these studies focus on either a limited number of response activities or a limited number of industries or organizations.

Taken together, this lack of theoretical advancement is rather problematic, for competitive responses to flexible regulations is also an area of increasing interest to both managers and regulators that must deal with policy uncertainty (Engau and Hoffmann, 2011a). In response, the aim of this study was to investigate how policy uncertainty affects organizational responses to flexible regulations. In particular, this study sought to determine the effect of policy uncertainty on the development of competitively valuable capabilities. Such an investigation was made possible by the unique circumstances of Australia's 2011 Clean Energy Act, which we explain in detail below.

METHOD

Empirical setting

In 2011, after several years of intense parliamentary debate, Australia passed the Clean Energy Act, which adopted flexible regulations and put a price on carbon emissions in efforts to curtail the growing magnitude of climate change (DCCEE, 2011; Garnaut, 2011). The Act possessed a great deal of flexibility in its design and uncertainty over its future, which qualifies the context as an “extreme case” of our object of inquiry and thus serves to better illuminate theoretical conceptions and implications (Eisenhardt, 1989; Yin, 1989).

In its design, the Act adopted an ETS, with a goal to reach national emissions reduction targets of five percent below 2000 levels by 2020 and 80 percent below 2000 levels by 2050. In order to achieve those goals, the Act put a price on carbon emissions starting on July 1, 2012 at 23 Australian dollars (AUD)/ton that would rise 2.5 percent per year for the first three years until July 1, 2015, when a true ETS would commence with a floating price determined by market forces. A price floor of 15 AUD/ton was originally intended but was removed when it was determined that Australia’s ETS would link with the E.U. ETS at the onset of the flexible price period (CER, 2012b). A price ceiling of 20 AUD/ton above the international price, however, was held intact. During the flexible price period, organizations would have the option of purchasing international offset credits such as Certified Emission Reductions (CERs), but those credits would be limited to 50 percent of a company’s total reduction starting from 2015. As a final source of flexibility, organizations could also purchase offset credits under the Carbon Farming Initiative (CFI), in which credits were generated by local farmers and land managers through various forms of sequestration and emissions avoidance projects (CER, 2012a).

However, almost immediately after passing parliament, the Clean Energy Act was shrouded in a thick fog of uncertainty. The first form of uncertainty was more technical and concerned the details of the regulations as, for example, many of the details around how CFI credits would be purchased and retired were still not released as of mid to late 2012, the time of this study. In addition, with the E.U.’s carbon price and international credit prices already in perennial freefall, predicting a future costing for carbon credits was near impossible. The second form of uncertainty was political, with Australia’s Opposition Leader Tony Abbott quickly pledging to repeal the Act if he were to become Prime Minister in the country’s 2013 election (Owen, 2012). With Abbott’s Coalition Party leading in most

national polls throughout 2012 (Cullen, 2012), repeal of the Act was widely regarded as a very real possibility.

A phenomenographic approach

Given that our study explored how organizations respond to flexible regulations, we determined that capturing variation in response was a key objective of our study, which led us to adopt a slight variation of the phenomenographic method (Ashworth and Lucas, 2000; Booth, 1997; Marton, 1981; Marton and Booth, 1997; Svensson, 1997).

Phenomenography—which has been an established methodological approach in education for several decades (Marton and Booth, 1997) but also used extensively in other disciplines such as computer programming (Booth, 1997), workplace competence (Sandberg, 2000), and internationalization practices (Lamb, Sandberg and Liesch, 2011)—is strongly linked to the philosophical underpinnings of phenomenology, which stipulate that the world is not a closed, objective reality but rather an “understood” reality (Sandberg, 2000). As such, the specific aim of phenomenography is to identify and describe the variation in these practices (Marton and Booth, 1997). The slight variation employed in this study is that we were not investigating an individual person’s practices but rather those of an organization. This treatment is similar to the common legal view of an organization as a single entity or person, but such an approach also required careful attention to how our methods and interpretation were carried out. In the following section, we explain these procedures.

Sampling, data, and analysis

Our sample was drawn from a population of over 300 organizations that were liable under the Clean Energy Act in mid 2012 (CER, 2012c). In order to ensure we captured the variation of responses to the regulations, we sought to obtain empirical data that captured the greatest possible variation in characteristics that may influence an organization’s response, as shown in Table 1.

INSERT TABLE 1 ABOUT HERE

For each organization, a research invitation was sent to the manager with responsibility for the organization's compliance with the Clean Energy Act. All organizations in the sample had a manager directly responsible for their compliance with the regulations, with most managers noting that they were the *only* person responsible for this liability. As supported by previous literature, we concluded that using the views of a single but well-qualified informant was sufficient to capture the organization's approach when, as in this case, knowledge and decision-making is highly centralized (Lyon, Lumpkin and Dess, 2000). In this study, theoretical saturation (Glaser and Strauss, 1967) was reached after the data from 16 organizations was analyzed, which is consistent with other phenomenographic studies (Lamb, Sandberg and Liesch, 2011; Sandberg, 2000). We added three more organizations to the sample to offer more validity to our findings, resulting in a final sample size of 19 liable entities.

We began our study by gaining familiarity with our research context by reading through all legislation related to the Clean Energy Act, conducting six informal interviews with experts in the fields of climate change and energy trading, and attending a conference on the introduction of the Act. Due to the novelty of these regulations and to ensure our study captured the issues of greatest relevance to managers and their respective organizations, semi-structured, in-depth interviews were selected to obtain primary data (Johnson, 2003). This primary data was then supplemented by a large amount of secondary data, as detailed below, in order to critically evaluate interviewee statements and provide a more rounded account of how the sampled organizations responded to the Act.

Interview data can, at times, be problematic due to interviewee attempts at concealing or distorting reality (Alvesson, 2003), which is a well-documented aspect of the fossil fuel industry's response to climate change (see, e.g., Beder, 2014). Consequently, we made several efforts in this study to minimize such distortion. First, before, during, and after each interview, we triangulated and verified interviewee statements with each organization's most recent environmental reports and web

pages, latest annual reports, and any relevant publically available submissions to government. These documents (which totaled over 1,000 pages) enabled the authors to probe, specify, and corroborate evidence from the interviews. Second, as opposed to only focusing on the large emitters of the fossil fuel industry, we included both big and small, private and government-owned organizations from a wide range of industries (see Table 1). This diverse sample allowed us to compare statements across various types of organizations. Third, as elaborated below, we did not accept interviewee statements at face value. Instead we critically evaluated each statement by asking numerous follow-up questions that required the interviewees to give actual examples of their organizations' responses.

The lead author conducted interviews both face-to-face and over the phone between July and November of 2012, just after the carbon price came into effect. All interviews were audio recorded, with most interviews lasting 45 to 90 minutes in length (resulting in 381 pages of single-spaced transcribed text).

During each interview, the following four questions were posed:

1. How does the Clean Energy Act affect your organization?
2. What actions has your organization taken in response to the Act?
3. What actions does your organization plan to take in the near future?
4. What variation in response do you see by organizations in Australia?

These questions were designed to capture the past, present, and future actions of each organization in response to the regulations. To ensure that each action was discussed in depth, as well as mitigating the potential risk of capturing "idealized" stories rather than "genuine" accounts of their responses (cf. Bourdieu et al., 1999), answers were then substantiated with several follow-up questions such as "What do you mean by that?" and "Can you provide an example that illustrates more specifically what you mean?"

Our analysis was formally divided into five phases. In the first phase, each interview was transcribed verbatim and then sent to the interviewee to check for errors and to allow him or her to add information. In the second phase, each transcript was analyzed according to *what* activities were involved in the organizations' responses. We took particular care in this phase to compare interview data with our secondary documentation to check for any signs of exaggeration or misrepresentation by

the interviewees (no such instances were found). The third phase consisted of re-reading each transcript and focusing on *how* organizations conducted these activities. The fourth phase was conducted by focusing on the what and how aspects together, while we looked for consistencies and inconsistencies in the data.

In the fifth and final phase, we analyzed how organizational responses affected capability development. Capabilities are the mechanisms that enable the most efficient and competitive use of an organization's assets and can be either tangible or intangible (Day, 1994). In order to serve as a source of competitive advantage, these capabilities need not only be valuable, rare, and non-substitutable (Barney, 1991; Dierickx and Cool, 1989; Reed and DeFillippi, 1990) but also inimitable through causal ambiguity or social complexity (Teece, 1987). In addition, through a consistent and sophisticated bundling of these activities, their mutual reinforcement can help to further differentiate individual capabilities (Barney, 1991; Wernerfelt, 1984). Accordingly, in this final stage of analysis, we examined whether and how the response activities and their unique configurations demonstrated the traits of capabilities that could have a competitive impact on regulated organizations.

ORGANIZATIONAL RESPONSES TO FLEXIBLE REGULATIONS UNDER POLICY UNCERTAINTY

As plans for an Australian ETS had been on the policy table for several years, almost all of the managers in our study were able to provide several examples of how they had been proactive in their preparation for the regulations. However, despite these attempts to be proactive, all interviewees noted that the political uncertainty surrounding the Act significantly affected their investment options: "It's very hard to get approval to do any mitigation activities given if the scheme is repealed, you're going to pack a real loss" (Participant #2, coded as P2). Several managers also added that the risk of repeal prevented them from purchasing CFI credits: "We would probably like to go off and start looking at some Australian offset opportunities, but why would I do those when the scheme might get repealed in 18 months' time?" (P18).

Our study also revealed that all organizations engaged in a common set of five activities in response to the Act. The first activity, *employing third party expertise*, refers to the use of external

parties, such as law firms, accounting firms, consultants, systems developers, and offset project developers. The second activity, *interacting with customers and suppliers*, includes activities such as casual phone calls and discussions, formal meetings and negotiations, prices changes, contract changes, and making and/or handling complaints. The third activity, *internal business and communication*, includes communications via email, training seminars, reports, and presentations and adjustments that covered business processes, structures, human resources, and the like. *Investing in mitigation and abatement* refers to any effort made to reduce or avoid carbon emissions, while *interacting with government* includes correspondence with an organization’s local, state, or federal (Australian) government.

While the organizations in our study all engaged in these same five activities, they also exhibited three qualitatively different overall responses to the regulations, which were (1) *understanding environmental law (EL)*, (2) *implementing environmental accounting (EA)*, and (3) *developing environmental management (EM)*. Consequently, each response resulted in each activity being enacted in markedly different ways. The variation in these responses and activities is illustrated in Table 2 and discussed in detail below.

INSERT TABLE 2 ABOUT HERE

Organizational response 1: Understanding environmental law (EL)

This group focuses primarily on understanding the legalities of the regulations. Managers in this group constantly cited the “administrative and legal complexities of the legislation in its various forms” (P17) and made full efforts to “understand the process for complying with the Clean Energy Act” (P19). These managers often noted how lengthy or “thick” (P17) the regulations and application forms were and labeled their biggest challenge as simply understanding the legislation.

These managers primarily used third party expertise to ensure compliance with the regulations. For one organization, third party expertise was first used to ensure they needed to comply: “We had

some differing views from the politicians to the organization, and we sought some legal advice. And it's pretty clear. It's the law. We must follow it" (P5). In general, these managers relied on advice from accounting firms, legal firms, and consultants, sometimes quite extensively: "We had it done by a consultant, and we had another independent consultant check the consultant's work as well" (P16).

This reliance is articulated in the following discussion with P19:

P19: So I guess that's another point, an interesting point, is the role that I guess service providers and third parties around climate change consultancies, law firms, what sort of role they play has been quite interesting.

Interviewer: Would you say you've used a lot of these resources and that they've been helpful? What do you mean by interesting?

P19: Well, essential, I guess.

In relation to their customers and suppliers, these managers focus on explaining and clarifying pass-through charges from the carbon price. Interviewees in this group all expressed a "difficulty was understanding what pass-through costs we would get" (P7) and engage in "quite a bit of work around trying to quantify whatever cost we had and looking at whether we could actually legitimately pass them on" (P17). Justifying pass-through costs was seen as particularly challenging: "So I guess there's been a legal process there looking at contracts, working out how that works and how we would allocate costs to our different customers because you can understand that it's difficult to attribute a particular carbon emission to a particular delivery" (P19).

The greatest impact that the regulations have on this group's internal business and communication is a need to reduce confusion and "panic in some respects" (P6) in the organization and explain the regulations to various departments and executives. All of the managers in this group commented on how time-consuming this process has been as, for example, expressed by P5 "And that's been difficult because the level of knowledge they've got from the media" and P6 "So some consultant came in. And they were training, and the first slide had three errors on it." For P7, explaining the regulations was the only major change in the organization: "We really didn't change very much ourselves. Well, hardly anything at all as a result of the carbon tax coming in, beyond education of the organization basically."

Concerning mitigation and abatement, these organizations spend a lot of time and effort on understanding their abatement and mitigation options, which include "energy efficiency, or fuel

switching, or looking at processes, or looking at more long-term things, options for shutting down for however many months to get ourselves [under the threshold]" (P17). Managers in this group are also concerned with understanding the impact that these options would have on their liability: "If we improve the way we do [a certain process], it'll impact our calculations. If we [create] more [product] as opposed to less [product], it's going to have an impact. There's a whole range of things" (P16). The uncertainty surrounding the legislation and future costs significantly affected these options, as stated by P6 "Because you've got a fair bit of uncertainty remaining as you're trying to budget for the next year's plan ... if we know how much our cost is to run for the next year or two years or three years, we can determine what we chase and what we don't chase."

For their interactions with government, this group is concerned with obtaining help and clarification. Some are looking for the government to help with complying: "We can go to the government and say 'hey, can you please be a broker for us' because otherwise we'd have to go out to tender ... so that would be really painful because I'm sure it will be the same as every other scheme that we've had and there will be a whole lot of cowboys in the market" (P5). Others are looking to receive help with disputes: "Look guys, you're the regulator. You're going to prosecute me if I get it wrong. So you need to help me out and tell me what" (P6).

Organizational response 2: Implementing environmental accounting (EA)

This group focuses almost exclusively on addressing the cost of the regulations. When asked about the effect the regulations had on their company, managers in this group consistently came back to the issue of cost, as expressed by P1 "For us, it's had very little impact other than cost flowing to the bottom line" and P12 "So resourcing and cost impacts are the main impacts." Organizations in this group focus their efforts on moving carbon emissions from an environmental issue to a business or "commercial" (P4) issue. This transition largely involves shifting all data from environmental reports to accounting systems: "We've turned it into a business issue, so my accounting friends undertake all the specific accounting and things like that" (P1).

As these organizations treat carbon emissions as an accounting cost, they use third party expertise to improve their emissions measurements and reduce their liability. These third parties typically

include auditors who can “pick up a few things around measurement that we had to improve” (P12) as well as consultants, industry partners, and system developers. These organizations look to “tap the expertise from the U.S.” (P15) and other locations where they have partnerships as they constantly search to upgrade their reporting systems and reduce their liability.

These organizations adopt a relatively defensive approach when dealing with customers and suppliers and concentrate more on negotiating the charge as opposed to simply clarifying it. Managers in this group described the negotiations as a “convoluted process” (P9) that is difficult with both suppliers and customers, as expressed by P14 “We have been back to our major raw materials suppliers and demanded the transparency of the pass-through costs because that’s an issue that we see a lot of people are going to get caught on” and P10 “So we’re trying to deal with our customers and pass-through costs and explain it all to them, and they are very skeptical and cynical of the whole thing in believing the likes of ourselves are just trying to stick ‘em for extra costs.” The feelings of this group are best summarized by P8 when asked how negotiations have been: “They’ve been terrible. Yeah, really, really terrible.”

This group’s internal business and communication is centered on improving their accounting and financial processes. These organizations attempt to “integrate [our liability] into our annual financial systems in order to properly deal with this” (P4), “build sensitivities into our business analysis” (P14), and place “the accountability for energy management, energy efficiency” (P11) with accounting and finance. Managers in this group were making plans for trading responsibility: “The proposal is that the actual permit transactions and trading, when trading comes in, will be done for us ... in Asia” (P13), but they also expressed concern over their ability to cope with a flexible price: “I think the biggest issue is capability for us in terms of managing the trading scheme. I mean, do you sell short and go long, who knows?” (P15).

When discussing mitigation and abatement, managers in this group constantly referred to their organizations’ priorities of reducing costs and only investing in projects with a short-term payback. Managers in this group were, for the most part, unable to cite any examples of investments already made in response to the Act. Those who were often commented that “[those abatement activities] have helped but nowhere near to eliminate the full exposure that we’ve got to the carbon tax” (P14).

Several organizations in this group were involved in various efforts to create new, higher-order methods for measuring their emissions, methods that led to substantial savings: “We’re looking at a 16 to 20 percent reduction in our liability just from using [this method]” (P11).

While all organizations in the sample made efforts to lobby legislators, this group made comparatively greater efforts to influence regulations in their interactions with government. Managers in this group noted that they make “quite a lot of carefully worded positive submissions about things” (P1) and labeled “seeking to influence regulatory outcomes” (P10) as one of their most important responses to the regulations. Similar to their dealings with customers and suppliers, this group was quite defensive in their approach: “We weren’t going to just accept whatever was being proposed, and we were in there putting in as much effort as possible into getting the best outcome for our company’s situation” (P4). Several managers in this group expressed frustration with getting “no relief” (P14) from the government after their extensive lobbying efforts.

Organizational response 3: Developing environmental management (EM)

Organizations with this response focus all of their efforts on “incorporating everything into the base business” (P2) with “a group that’s been set aside to look at optimizing the portfolio” (P18). To this group, optimizing the portfolio does not mean only investing in mitigation or abatement activities, but rather these managers balanced their conversation and organizations’ investments around low and high-emissions activities as they carefully responded to each additional policy decision. For example, P3 explained that because their portfolio had “been biased toward lower emissions [products]” and the regulations gave them “a little bit of breathing space,” their organization recently “acquired a very large [emissions intensive product].” Similar to the other groups, this group was highly frustrated with the lack of political certainty:

When you’re managing these sorts of things, you’re managing at a 20-year timeframe. You’re looking at investing in a certain emissions reduction opportunity. So you’re talking about a 20-year view of the world when you’ve got maybe a 12-months’ view of certainty (P18).

These organizations used third party expertise to develop detailed carbon management procedures and internal capabilities: “We used [them] to write a manual for how we manage carbon. We call it a process narrative, and it’s more of an overview guide to how the systems work and underneath each

section, you go down to the individual departments” (P2). These organizations also made use of expertise within their company but outside traditional areas of carbon reporting and accounting. For example, P3 stressed that “a large part of that too, quite honestly, was you had a person there specifically to deal with change. The psychology of it all, if that makes sense. Making sure the communications were timely, relevant, explained to people what the issues are and make sure that the organization moves accordingly” (P3).

When engaging with customers and suppliers, these managers did not discuss any lengthy or difficult negotiations but rather discussed their efforts to align their operations and maintain goodwill with various suppliers, customers, and partners. These managers frequently noted that “ensuring our participants were all aligned on how we would operate under the scheme was a key piece of work” (P3) and were “very mindful of preserving goodwill” (P18). Managers in this group talked at length about their interactions with business partners: “So one of the first things we did, and it occupied about the first six months of this year, is each one of our joint ventures that was likely to have a liability, we sat down with the participants and worked through the nuts and bolts of how exactly the joint venture was going to work under the scheme” (P18).

Regarding their internal business and communication, this group focused on changing the mindset of their employees, following carefully established principles, and refining their internal systems and structures to accommodate those principles. These organizations saw carbon regulations as “a change management process” (P3) that “requires a different mindset to how you manage that command-and-control regulation” (P18). Managers in this group expressed frustration with engineers or other staff that “still approach greenhouse using the environmental kind of approach of trying to reduce [emissions] to as low as reasonably practicable” because “the way to regulate [emissions] is evolving into a different world, and we needed to think about it differently” (P18).

Managers in this group spent very little time discussing isolated mitigation and abatement activities that would lower their carbon liability. What they did discuss at length was how their organizations were building extensive carbon management systems that would reduce their enterprise’s overall management cost. Given the amount of uncertainty in the scheme’s future, these managers continually came back to the issue of maintaining a balanced portfolio, as summarized by

P3: “If you’ve got uncertainty, then you need balance. I mean, you think of it in portfolio theory terms ... so this is sort of a standard downside risk management exercise right now.”

In their interactions with government, Managers in this group were quick to note that they were engaged from the beginning and that their current efforts were concentrated on “cleaning up the remaining policy space” (P18). As compared to other groups, managers in this group were more critical of policymakers, as expressed by P3 “I mean, all policies have unintended consequences. It’s just a matter of how obvious they are when you’re rolling out a policy or whether that policymaker needs a swift kick to remind him as much.”

The relationship between organizational responses and capability development

Table 3 provides a summary of the relationship between regulatory response and capability development, which we explain below.

INSERT TABLE 3 ABOUT HERE

While organizations with an EL response engaged in a number of activities in response to the regulations, their responses demonstrated no evidence of unique innovations or a bundling of activities and thus offer no prospect of developing competitively valuable capabilities.

In contrast, organizations with an EA response and those with an EM response made a number of unique investments and innovations, which were also mutually reinforcing, that enabled them to develop unique capabilities in response to the new regulations. For example, organizations with an EA response were investing in numerous ways to generate cost savings and lower their liability, such as investments in state-of-the-art reporting and modeling systems, enhanced sensitivity analysis in their financial departments, and higher-order measuring methods that resulted in immediate savings. Organizations with an EM response made quite different, but still mutually reinforcing, long-term investments in their base business and portfolio, such as through rebalancing their organization’s level

of emissions intensity in relation to the regulatory climate, in developing detailed process narratives for emissions management, in hiring change management experts to provide timely communication, and in establishing clear principles to ensure a consistent response across their business units.

The variation in innovation and investment by organizations with an EA response and those with an EM response thus reveals a distinct variation in capability development. Put simply, organizations with an EA response were developing capabilities in regulatory cost savings in order to reduce the cost impact of the new regulations, while organizations with an EM approach were developing capabilities in regulatory management in order to ensure an integrated and holistic corporate response to the regulations. Hence, the focus of an organization's response to the regulations not only determined how it would conduct a range of activities but also determined its ability to develop unique capabilities.

Possible sources of variation in response

A further question of interest is the extent to which the variation in responses is linked to the sample characteristics of each group. As seen in Table 4, ownership does not appear to have any strong effect on response, other than the observation that no government-owned entity was found to have an EM response. However, only four government-owned organizations were included in the sample, rendering any further conclusion premature. Similarly, geographic scope appears to have very little, if any, relationship with an organization's response.

One characteristic that seems to have an observable influence on response is the size of the organization as seen through the mean number of employees in each group. The effect found is that smaller organizations were predominantly found to have an EL response, while larger firms tended to have either an EA or an EM response. Lastly, given the small sample sizes from each industry, in some cases being only one organization, it is difficult to reach any conclusion about possible industry effects. Where applicable, participants from the same industry tended to vary in response.

INSERT TABLE 4 ABOUT HERE

DISCUSSION

We began this paper by noting two competing views on how organizations respond to flexible regulations amidst policy uncertainty, those being the Porter Hypothesis (Porter, 1991; Porter and van der Linde, 1995) and the view of RBV scholars (e.g., Aragón-Correa and Sharma, 2003; Carrera *et al.*, 2003; López-Gamero, Molina-Azorín and Claver-Cortés, 2011). Through an investigation of Australia's complex and rather short-lived Clean Energy Act of 2011, our study demonstrates that these theories, while possessing useful elements, are both incomplete and thus incorrect. Below, we discuss the shortcomings of extant theory and, building on these theories, develop a higher-level model for understanding the competitive effects of policy uncertainty.

Our initial findings are straightforward: policy uncertainty forced regulated organizations to focus their responses on short-term investments with immediate paybacks and, even more so, on dealing with that very uncertainty, such as by constantly lobbying government and attempting to reduce confusion amongst their staff, customers, and suppliers. As a result, organizations in our study responded to the new regulations with very few substantial efforts at reducing their carbon emissions. Quite the contrary, the sampled organizations seemingly made every effort to avoid such reductions, such as by challenging their need to comply with the new regulations, applying new methods that merely reduced their emissions on paper, and criticizing engineers that put too much focus on emissions reductions.

Such a finding adds some support to literature in line with the Porter Hypothesis that concludes that, under conditions of policy uncertainty, environmental regulations have little to no effect on stimulating large-scale investments (e.g., Barradale, 2010; Bourgeois, 1985; Isik, 2004; Marcus, 1981; Marcus and Kaufman, 1986), even if those regulations afford a great deal of flexibility (e.g., Borghesi, Cainelli and Mazzanti, 2015; Brewer, 2005; Cadez and Czerny, 2010; Hoffmann, 2007; Pinkse and Kolk, 2010; Wossink and Gardebroek, 2006).

Conversely, these findings contradict a few studies from the E.U. that found organizations in Europe did in fact continue to invest in green technologies (Delarue, Voorspools and D'haeseleer, 2008; Hoffmann, Trautmann and Hamprecht, 2009; Okereke and Russel, 2010). These conflicting results further underscore the impact of policy uncertainty, which was significantly greater in Australia, with the E.U.'s ETS now in operation for over 10 years. Taken together with the unavoidably large indirect costs of flexible regulations, the conclusion that policy uncertainty prohibits investment suggests that not only would organizations be unable to offset the cost of compliance but they would also find themselves at a significant cost *disadvantage* to their unregulated foreign rivals.

However, while our findings showed no evidence of green capability development, we did find that organizations were able to develop unique capabilities with the potential to serve as a form of competitive advantage. As seen in Table 3, while organizations with an EL response were unable to generate any unique capabilities, organizations with EA and EM responses were able to generate capabilities in regulatory cost savings and regulatory management, respectively. As such, in response to the introduction of flexible environmental regulations amidst high levels of policy uncertainty, *organizations in our study responded by developing unique capabilities in activities required to cope with the new regulations*. Collectively, these can be referred to as “regulatory coping capabilities,” which, in contrast to green capabilities, merely aid organizations in complying with a set of complex regulations and may or may not be associated with better environmental performance.

The conclusion that flexible environmental regulations under regulatory uncertainty result in a competitive push for regulatory coping capabilities could be viewed in a number of ways. For one, our findings provide strong evidence that large organizations have a decipherable advantage over smaller organizations when developing these capabilities. Previous studies have shown that while small organizations may not be at a competitive disadvantage in terms of being environmentally proactive (Aragón-Correa *et al.*, 2008; Veugelers, 2012), they often incur disproportionately larger costs as a result of environmental regulations (Loader and Hobbs, 1999; Pashigan, 1984; Reinhardt, 1999), which can ultimately create an additional barrier to entry for new firms (Dean and Brown,

1995). Thus, if flexible regulations in these conditions disadvantage smaller firms and ultimately reduce competition, innovation would only be stifled more.

Drawing on ideas from the Porter Hypothesis, however, may help to frame such a conclusion in a more positive light. That being, if domestic regulations do in fact anticipate international trends, then regulated multinational organizations would be developing regulatory coping capabilities that are internationally transferable. One of our interviewees did indeed suggest such a phenomenon was occurring: “Well, one thing we do now is we use the expertise we’ve gained here to help other jurisdictions around the world” (P2). Considering the large number of countries that are on track to implement or are considering implementing an ETS with similar flexibility options such as international and domestic offset credits, regulated multinational firms in Australia have the potential to develop a form of absolute advantage over currently unregulated foreign rivals.

Toward a synthesizing framework

By building on and extending ideas from both the Porter Hypothesis and RBV scholars, our study is able to transcend competing theories on how policy uncertainty affects organizational responses to flexible regulations. As shown in Figure 1 (which combines our findings with results from previous studies), instead of achieving their intended goals of stimulating innovation and the development of green capabilities, flexible regulations under policy uncertainty result in organizations being unable to make significant investments in green technologies, with some organizations relying solely on the development of regulatory coping capabilities to achieve any competitive advantage as a result of the regulations. A further question theorized in this framework is the potential impact of policy uncertainty on command-and-control regulations. While uncertainty in this case is likely to affect the speed with which organizations comply with regulations, it is unlikely that simplistic command-and-control policies—bereft of the complexity and degree of decision making associated with flexible policies—would result in the development of any unique capabilities.

INSERT FIGURE 1 ABOUT HERE

Our framework thus integrates insights from existing knowledge and this study on how type of regulation and degree of policy certainty interact to influence organizational responses and capability development and therefore represents a higher-level model by which researchers, practitioners, and policy makers can better understand and study such a phenomenon. For example, the upper right quadrant predicts an immediate and “green” response from regulated organizations, which is precisely what transpired in the U.S. Acid Rain Program in 1990, a program that offered flexibility in the trade of sulfur dioxide emissions and was well supported throughout its design and implementation (Majumdar and Marcus, 2001; Marcus and Geffen, 1998). It is important to add here that, as with many frameworks, individual circumstances are also likely to cross multiple quadrants, which may explain why the E.U.’s ETS, which has been subject to varying degrees of uncertainty throughout its existence, resulted in such a mixed response from regulated entities.

Our results thus offer a roadmap and several tools to assist managers in developing their organization’s response to environmental policies, which, as we have discussed, is a particularly difficult task given the high levels of complexity and uncertainty surrounding these regulations. First, Tables 2 and 3 provide managers with comprehensive frameworks by which to plan their overall response, their subset of response activities, and their investment portfolio in relation to their competitors. Figure 1 then provides managers with a higher-level framework by which they can better understand and anticipate policy effects on their industry.

Limitations and further research

Our study, and its limitations, also offers some direction for future research on these regulations and managerial responses. As our study was limited to the findings unveiled through interview data and secondary sources such as publically available reports and government submissions, future studies could further explore the overall responses and the subset of response activities through a more

focused investigation at a smaller number of firms. Given the contested and highly politicized nature of environmental issues such as climate change (see, e.g., Brulle, 2013; Crowley, 2013), in-depth studies of a single or few organizations could provide some much needed insight into their ongoing internal and external political and environmental dialectics. In addition, scholars could use the categories identified in this study to set up large-scale, quantitative studies to more thoroughly explore the antecedents to these responses.

As our study demonstrates how policy uncertainty prevents flexible regulations from achieving their intended policy results, we conclude by wondering whether environmental issues of the scale, complexity, and immediacy of climate change might be better tackled with less flexible—but more certain—environmental policies. In Europe, an oversupply resulted in permit prices crashing from a high of €32 a ton in 2006 to under €3 a ton in 2013, a drop that is slowly unraveling confidence in the E.U.’s scheme (World Bank, 2014). Even more dramatic, in Australia, repeal of the Clean Energy Act in 2014 coincided with a remarkable 90 percent drop in clean energy investment in that same year (Pearson, 2015). Although the Act has been replaced with a new, voluntary scheme that still offers considerable flexibility (CER, 2016), uncertainty over this new plan’s future has clearly offered little incentive in the way of green capability development. Hence, future work on these regulations must (continue to) question the efficacy of “flexible” plans to save our environment.

REFERENCES

- Akter, S., R. Brouwer, L. Brander and P. van Beukering (2009). 'Respondent uncertainty in a contingent market for carbon offsets', *Ecological Economics*, **68**, pp. 1858–1863.
- Alvesson, M. (2003). 'Beyond neo-positivism, romanticism and localism: A reflexive approach to interviews', *Academy of Management Review*, **28**, pp. 13–33.
- Aragón-Correa, J. A., N. Hurtado-Torres, S. Sharma and V. Garcia-Morales (2008). 'Environmental strategy and performance in small firms: A resource-based perspective', *Journal of Environmental Management*, **86**, pp. 88–103.
- Aragón-Correa, J. A. and S. Sharma (2003). 'A contingent resource-based view of proactive corporate environmental strategy', *Academy of Management Review*, **28**, pp. 71–88.
- Ashworth, P. and U. Lucas (2000). 'Achieving empathy and engagement: A practical approach to the design, conduct and reporting of phenomenographic research', *Studies in Higher Education*, **25**, pp. 295–308.
- Barney, J. (1991). 'Firm resources and sustained competitive advantage', *Journal of Management*, **17**, pp. 99–120.
- Barradale, M. (2010). 'Impact of public policy uncertainty on renewable energy investment: Wind power and the production tax credit', *Energy Policy*, **38**, pp. 7698–7709.
- Beder, S. (2014). 'Lobbying, greenwash and deliberate confusion: How vested interests undermine climate change', in M. C-T. Huang and R. R-C. Huang (Eds.), *Green Thoughts and Environmental Politics: Green Trends and Environmental Politics*, pp. 297–328, Taipei, Taiwan: Asia-seok Digital Technology.
- Bloodgood, J. (2014). 'Enhancing the resource-based view of the firm: Increasing the role of awareness', *Strategic Management Review*, **8**, pp. 61–75.
- Böhm, S., M. Misoczky and S. Moog (2012). 'Greening capitalism? A marxist critique of carbon markets', *Organization Studies*, **33**, pp. 1617–1638.
- Booth, S. (1997). 'On phenomenography, learning and teaching', *Higher Education Research & Development*, **16**, pp. 134–158.

- Borghesi, S., G. Cainelli and M. Mazzanti (2015). 'Linking emission trading to environmental innovation: Evidence from the Italian manufacturing industry', *Research Policy*, **44**, pp. 669–683.
- Bourdieu, P., A. Accardo, G. Balazs, S. Beaud, F. Bonvin, E. Bourdieu, et al. (1999). *The Weight of the World: Social Suffering in Contemporary Society*. Stanford, CA: Stanford University Press.
- Bourgeois, L. (1985). 'Strategic goals, perceived uncertainty, and economic performance in volatile environments', *Academy of Management Journal*, **28**, pp. 548–573.
- Brewer, T. (2005). 'Business perspectives on the E.U. emissions trading scheme', *Climate Policy*, **5**, pp. 137–144.
- Brulle, R. (2014). 'Institutionalizing delay: Foundation funding and the creation of U.S. climate change counter-movement organizations', *Climatic Change*, **122**, pp. 681–694.
- Cadez, S. and A. Czerny (2010). 'Carbon management strategies in manufacturing companies: An exploratory note', *Journal for East European Management Studies*, **15**, pp. 348–360.
- Carrera, A., L. Mesquita, G. Perkins and R. Vassolo (2003). 'Business groups and their corporate strategies on the Argentine roller coaster of competitive and anti-competitive shocks', *Academy of Management Executive*, **17**, pp. 32–44.
- CER (2012a). *Carbon Farming Initiative*. Canberra: Clean Energy Regulator.
- CER (2012b). *Carbon Pricing Mechanism: Flexible Price Period from 2015*. Canberra: Clean Energy Regulator.
- CER (2012c). *Carbon Pricing Mechanism: LEPID for 2012–2013 Financial Year*. Canberra: Clean Energy Regulator.
- CER (2016). *About the Emissions Reduction Fund*. Canberra: Clean Energy Regulator.
- Coase, R. H. (1960). 'The problem of social cost', *Journal of Law and Economics*, **3**, pp. 1–44.
- Crotty, J. and M. Smith (2006). 'Strategic responses to environmental regulation in the U.K. automotive sector: The European Union End-Of-Life Vehicle Directive and the Porter Hypothesis', *Journal of Industrial Ecology*, **10**, pp. 95–111.

- Crowley, K. (2013). 'Irresistible force? Achieving carbon pricing in Australia', *Australian Journal of Politics and History*, **3**, pp. 368–381.
- Cullen, S. (2012). 'Gillard gets boost but Labor still trails in Nielsen poll', *ABC News*. Available at: <http://www.abc.net.au/news/2012-10-22/gillard-surges-ahead-as-preferred-pm-in-nielsen-poll/4325840> [accessed 22 October 2012].
- Dales, J. H. (1968). 'Land, water, and ownership', *The Canadian Journal of Economics*, **1**, pp. 791–804.
- Day, G. (1994). 'The capabilities of market-driven organizations', *Journal of Marketing*, **58**, pp. 37–52.
- DCCEE (2011). *An Overview of the Clean Energy Legislative Package*. Canberra: Department of Climate Change and Energy Efficiency.
- Dean, T. and R. Brown (1995). 'Pollution regulation as a barrier to new firm entry: Initial evidence and implications for future research', *Academy of Management Journal*, **38**, pp. 288–303.
- Delarue, E., K. Voorspools and W. D'haeseleer (2008). 'Fuel switching in the electricity sector under the EU ETS: Review and prospective', *Journal of Energy Engineering*, **June**, pp. 40–46.
- Dierickx, I. and K. Cool (1989). 'Asset stock accumulation and sustainability of competitive advantage', *Management Science*, **35**, pp. 1504–1511.
- Eisenhardt, K. (1989). 'Building theories from case research', *Academy of Management Review*, **14**, pp. 532–550.
- Engau, C. and V. Hoffmann (2011a). 'Corporate response strategies to regulatory uncertainty: Evidence from uncertainty about post-Kyoto regulation', *Policy Science*, **44**, pp. 53–80.
- Engau, C. and V. Hoffmann (2011b). 'Strategizing in an unpredictable climate: Exploring corporate strategies to cope with regulatory uncertainty', *Long Range Planning*, **44**, pp. 42–63.
- Engels, A., L. Knoll and M. Huth (2008). 'Preparing for the 'real' market: National patterns of institutional learning and company behaviour in the European Emissions Trading Scheme (EU ETS)', *European Environment*, **18**, pp. 276–297.
- Garnaut, R. (2011). *Garnaut Climate Change Review*. Canberra: Commonwealth of Australia.

- Glaser, B. G. and A. L. Strauss (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine.
- Hart, S. (1997). 'Beyond greening: Strategies for a sustainable world', *Harvard Business Review*, **75**, pp. 66–76.
- Hoffmann, V. (2007). 'EU ETS and investment decisions: The case of the German electricity industry', *European Management Journal*, **25**, pp. 464–474.
- Hoffmann, V., T. Trautmann and J. Hamprecht (2009). 'Regulatory uncertainty: A reason to postpone investments? Not necessarily', *Journal of Management Studies*, **46**, pp. 1227–1253.
- Hoppmann, J., M. Peters, M. Schneider and V. Hoffmann (2013). 'The two faces of market support—How deployment policies affect technological exploration and exploitation in the solar photovoltaic industry', *Research Policy*, **42**, pp. 989–1003.
- Isik, M. (2004). 'Incentives for technology adoption under environmental policy uncertainty: Implications for green payment programs', *Environmental and Resource Economics*, **27**, pp. 247–263.
- Johnson, J. M. (2003). 'In-depth interviewing', in J. J. Gubrium and J.A. Holstein (Eds.), *Handbook of Interview Research: Context and Method*, pp. 103–120, Thousand Oaks, CA: Sage.
- Kock, C. J., J. Santalo and L. Diestre (2012). 'Corporate governance and the environment: What type of governance creates greener companies?', *Journal of Management Studies*, **49**, pp. 492–514.
- Kolk, A. and J. Pinkse (2007). 'Multinationals' political activities on climate change', *Business and Society*, **46**, pp. 201–228.
- Kolk, A. and J. Pinkse (2008). 'A perspective on multinational enterprises and climate change: Learning from 'an inconvenient truth'? *Journal of International Business Studies*, **39**, pp. 1359–1378.
- Lamb, P., J. Sandberg and P. Liesch (2011). 'Small firm internationalization unveiled through phenomenography', *Journal of International Business Studies*, **42**, pp. 672–693.

- Levy, D. L. and D. Egan (2003). 'A neo-Gramscian approach to corporate political strategy: Conflict and accommodation in the climate change negotiations', *Journal of Management Studies*, **40**, pp. 803–829.
- Lim, S. and A. Prakash (2014). 'Voluntary regulations and innovation: The case of ISO 14001', *Public Administration Review*, **74**, pp. 233–244.
- Loader, R. and J. Hobbs (1999). 'Strategic responses to food safety legislation', *Food Policy*, **24**, pp. 685–706.
- Lohmann, L. (2009). 'Towards a different debate in environmental accounting: The cases of carbon and cost-benefit', *Accounting, Organizations and Society*, **34**, pp. 499–534.
- López-Gamero, M. and J. Molina-Azorín (2015). 'Environmental management and firm competitiveness: The joint analysis of external and internal elements', *Long Range Planning*, DOI: 10.1016/j.lrp.2015.12.002.
- López-Gamero, M., J. Molina-Azorín and E. Claver-Cortés (2011). 'Environmental uncertainty and environmental management perception: A multiple case study', *Journal of Business Research*, **64**, pp. 427–435.
- Lyon, D., G. Lumpkin and G. Dess (2000). 'Enhancing entrepreneurial orientation research: Operationalizing and measuring a key strategic decision making process', *Journal of Management*, **26**, pp. 1055–1085.
- Majumdar, S. (1997). 'Incentive regulation and productive efficiency in the U.S. telecommunications industry', *Journal of Business*, **70**, pp. 547–576.
- Majumdar, S. and A. Marcus (2001). 'Rules versus discretion: The productivity consequences of flexible regulation', *Academy of Management Journal*, **44**, pp. 170–179.
- Marcus, A. (1981). 'Policy uncertainty and technological innovation', *Academy of Management Review*, **6**, pp. 443–447.
- Marcus, A. and D. Geffen (1998). 'The dialectics of competency acquisition: Pollution prevention in electric generation', *Strategic Management Journal*, **19**, pp. 1145–1168.
- Marcus, A. and A. Kaufman (1986). 'Why it is so difficult to implement industrial policies: Lessons from the synfuels experience', *California Management Review*, **28**, pp. 98–114.

- Marton, F. (1981). 'Phenomenography: Describing conceptions of the world around us', *Instructional Science*, **10**, pp. 177–200.
- Marton, F. and S. Booth (1997). *The Idea of Phenomenography*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Okereke, C. and D. Russel (2010). 'Regulatory pressure and competitive dynamics: Carbon management strategies of UK energy-intensive companies', *California Management Review*, **52**, pp. 100–124.
- Owen, M. (2012). 'Tax vow boosted by state's carbon costing', *The Australian*. Available at: <http://www.theaustralian.com.au/national-affairs/carbon-tax/tax-vow-boosted-by-states-carbon-costing/story-fndttws1-1226488500047> [accessed 5 October 2012].
- Pashigan, B. (1984). 'The effect of environmental regulations on optimal plant size and factor shares', *Journal of Law and Economics*, **27**, pp. 1–27.
- Pearson, C. (2015). 'Renewable energy investment drops by 90pc', *The Australian Oil and Gas Review*. Available at: <http://oilandgasreview.com.au/renewable-energy-investment-drops-90pc/> [accessed 20 January 2016].
- Pellizzoni, L. (2011). 'Governing through disorder: Neoliberal environmental governance and social theory', *Global Environmental Change*, **21**, pp. 795–803.
- Pinkse, J. and A. Kolk (2010). 'Challenges and trade-offs in corporate innovation for climate change', *Business Strategy and the Environment*, **19**, pp. 261–272.
- Porter, M. (1991). 'America's green strategy', *Scientific American*, **April**, p. 168.
- Porter, M. and C. van der Linde (1995). 'Toward a new conception of the environment-competitiveness relationship', *The Journal of Economic Perspectives*, **9**, pp. 97–118.
- Reed, R. and R. DeFillippi (1990). 'Causal ambiguity, barriers to imitation, and sustainable competitive advantage', *Academy of Management Review*, **15**, pp. 88–102.
- Reinhardt, F. (1999). 'Market failure and the environmental policies of firms: Economic rationales for "beyond compliance" behavior', *Journal of Industrial Ecology*, **3**, pp. 9–21.
- Renwick, D., T. Redman and S. Maguire (2013). 'Green human resource management: A review and research agenda', *International Journal of Management Reviews*, **15**, pp. 1–14.

- Rueda-Manzanares, A., J. A. Aragón-Correa and S. Sharma (2007). 'The influence of stakeholders on the environmental strategy of service firms: The moderating effects of complexity, uncertainty and munificence', *British Journal of Management*, **19**, pp. 185–203.
- Rugman, A. M. and A. Verbeke (2000). 'Six cases of corporate strategic responses to environmental regulation', *European Management Journal*, **18**, pp. 377–385.
- Sandberg, J. (2000). 'Understanding human competence at work: An interpretative approach', *Academy of Management Journal*, **43**, pp. 9–25.
- Sharma, S. (2000). 'Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy', *Academy of Management Journal*, **43**, pp. 681–697.
- Shrivastava, P. (1995). 'The role of corporations in achieving ecological sustainability', *Academy of Management Review*, **20**, pp. 936–960.
- Srivastava, S. (2007). 'Green supply-chain management: A state-of-the-art literature review', *International Journal of Management Reviews*, **9**, pp. 53–80.
- Svensson, L. (1997). 'Theoretical foundations of phenomenography', *Higher Education Research & Development*, **16**, pp. 159–171.
- Teece, D. (1987). *The Competitive Challenge*. Cambridge, MA: Ballinger.
- Veugelers, R. (2012). 'Which policy instruments to induce clean innovating?', *Research Policy*, **41**, pp. 1770–1778.
- Wagner, M. (2013). '“Green” human resource benefits: Do they matter as determinants of environmental management system implementation?', *Journal of Business Ethics*, **114**, pp. 443–456.
- Wernerfelt, B. (1984). 'A resource-based view of the firm', *Strategic Management Journal*, **5**, pp. 171–180.
- Wossink, A. and C. Gardebroek (2006). 'Environmental policy uncertainty and marketable permit systems: The Dutch phosphate quota program', *American Journal of Agricultural Economics*, **88**, pp. 16–27.
- Yin, R. (1989). *Case Study Research*. Beverly Hills, CA: Sage.
- World Bank. (2014). *State and Trends of Carbon Pricing, 2014*. Washington, DC: World Bank.

Table 1. Descriptive characteristics of sample

<i>Number of organizations</i>	19 liable entities
<i>Industries</i>	aluminum, electricity, energy, food and beverage, gas, household goods, industrial goods, mining, oil, waste disposal
<i>Ownership</i>	
Private	15
Government	4
<i>Geographic scope</i>	
Domestic	9
Global	10
<i>Size (employees)</i>	
Mean	35,454
Median	3,500
Range	under 300 to over 100,000

Table 2. Organizational responses to flexible environmental regulations

Organizational response	Focus of response	Subset of activities				
		Third party expertise	Customers and suppliers	Internal business and communication	Mitigation and abatement	Interactions with government
(1) Understanding environmental law	Understand regulations and their impact	Used to ensure compliance	Explain and clarify pass-through charges	Reduce confusion and explain regulations	Understand options and impact of activities	Obtain help and clarification
(2) Implementing environmental accounting	Reduce liability and cost of regulations	Used to improve measurement and reduce liability	Negotiate pass-through charges	Improve accounting and finance processes	Implement options that reduce costs	Lobby and apply for assistance
(3) Developing environmental management	Integrate issue into base business and optimize portfolio	Used to develop management procedures and capabilities	Align operations and maintain goodwill	Change mindset, follow principles, and refine systems and structure	Optimize portfolio and streamline activities	Clean up remaining policy space

Table 3. The relationship between organizational response and capability development

Organizational response	Representative investments	Representative innovations	Capabilities
(1) Understanding environmental law	<ul style="list-style-type: none"> • Advice on compliance from law, consulting, and accounting firms 	<ul style="list-style-type: none"> • No evidence of innovations 	No evidence of unique capability development
(2) Implementing environmental accounting	<ul style="list-style-type: none"> • Hiring personnel and contracting third parties to improve measurements and reporting systems • Improving accounting and financial systems • Centralized trading platforms • Abatement activities with immediate savings • Frequent lobbying trips 	<ul style="list-style-type: none"> • Advanced models • Higher-order measurement methods 	Regulatory cost savings
(3) Developing environmental management	<ul style="list-style-type: none"> • Balanced portfolio of low and high-emissions activities • Contracting third parties to develop detailed carbon management procedures • Hiring change management experts • Lengthy discussions with joint venture partners • Refining organizational structure • Early and frequent engagement with policy makers 	<ul style="list-style-type: none"> • Unique process narratives • Enterprise-wide carbon management systems 	Regulatory management

Table 4. Organizational responses related to sample characteristics

	(1) Understanding environmental law	(2) Implementing environmental accounting	(3) Developing environmental management
<i>No. of organizations</i>	6	10	3
<i>Industries</i>	Energy, food and beverage, mining (2), waste disposal (2)	Aluminum, conglomerate, electricity, energy, food and beverage, household goods, industrial goods, mining (3)	Energy, oil (2)
<i>Ownership</i>			
Private	4	8	3
Government	2	2	0
<i>Geographic scope</i>			
Domestic	4	4	1
Global	2	6	2
<i>Size (employees)</i>			
Mean	7,382	48,373	48,533

Figure 1. Synthesizing framework of how type of environmental regulation and degree of policy certainty affect organizational responses and capability development

