

Policy entrepreneurship in climate governance: Toward a comparative approach

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Abstract

This paper draws out lessons from the special issue, laying out elements of research agenda on climate policy entrepreneurship. First, I offer an expanded definition of entrepreneurship, which distinguishes between the entrepreneurs themselves and the strategies they employ. Further refinements of the concept of entrepreneurship should specify other relevant dimensions of variation, such as the desired outcome, and the expected time frame in which it is to be achieved. I then present a simple causal model of entrepreneurship to facilitate future comparative research. Based on the papers in the special issue, I derive several testable hypotheses for future research. Finally, I argue that we must also consider the “expansive effects” of policy entrepreneurs: the extent to which their actions lead to changes beyond those intended. I offer some approaches to begin to study these broader effects.

Keywords

Climate change, policy entrepreneurs, climate governance

This special issue demonstrates the many opportunities for policy entrepreneurs to shape climate policy. Climate change is a profound and complex *societal* problem, which will require behavioral changes across many sectors of the economy. It is appropriate then, that this special issue considers the role of policy entrepreneurs in contributing to those changes. The papers in this issue consider the various strategies used by entrepreneurs, and the conditions under which they are successful at effecting policy change.

This concluding paper draws out lessons from the special issue, and lays out several facets of a research agenda on policy entrepreneurship in the realm of climate change. There are two goals of such an agenda: (1) To foster comparative research about climate policy entrepreneurship, and (2) To provide some conceptual apparatus for evaluating the *aggregate* effects of various efforts at policy entrepreneurship in the area of climate change.

I proceed in three parts, at three levels of analysis. First, building on the introductory paper by Boasson and Huitema, I expand on the concept of policy entrepreneurship. The editors usefully distinguish between structural and cultural strategies employed by

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entrepreneurs. I suggest that comparative research must distinguish between strategies and the actors that employ them. Strategies are the causal mechanisms that link the independent variable (entrepreneurs) to the dependent variable (some form of policy change).

Moreover, I emphasize the need to delineate the time frame in which entrepreneurship takes place. In order to understand whether entrepreneurs have been successful (i.e. change has occurred), one must specify *ex ante* where to look for such changes temporally.

Second, building on the definition that specifies the dimensions of variation, I offer a simple causal model of entrepreneurship. This distinguishes the actors from the strategies that they employ, and identifies possible relevant dimensions of the policy context—a critical component for both Boasson and Huitema as well as the other authors.

Finally, I turn to the critical outcome question: under what conditions can policy entrepreneurs effect meaningful action on climate change? In order to answer this question, we will need new tools for aggregating the effects of entrepreneurship across multiple levels of governance.

Defining policy entrepreneurs

In his seminal work, *Agendas, Alternatives and Public Policies*, Kingdon defines entrepreneurs as follows: “their defining characteristic... is their willingness to invest their resources—time, energy, reputation and sometimes money—in the hope of a future return. That return might come in the form of policies of which they approve, satisfaction from participation, or even personal aggrandizement...” (Kingdon, 2002: 122–123). This definition is broad, to say the least; at the most basic level, it is difficult to identify which actors would *not* be included in this definition. Even the staunchest supporters of the status quo would be included, if their motivation was to enrich themselves in some way.

If, following Sartori, concepts (like entrepreneurship) are “data containers,” then Kingdon’s vague definition does a disservice to comparative research (Sartori, 1970: 1039). Here, I heed Sartori’s warning that “the net result of conceptual straining is that our gains in extensional coverage tend to be matched by losses in connotative precision” (Sartori, 1970: 1035).

In order to make headway on understanding the potential contributions of policy entrepreneurs, more conceptual precision is needed. The challenge, then, is to develop categories with a high degree of “discriminating power”, to reduce the “misgathering” of information (Sartori, 1970: 1039). In this section, I aim to “sort” the definitions of entrepreneurship in this issue, to develop a conceptualization that facilitates comparative research.

In their introductory essay, Boasson and Huitema distinguish between structural and institutional entrepreneurship. The former are “acts aimed at enhancing governance influence by altering distribution of authority and information.” (p. 1345) The latter highlights “what actors may do to ensure that their ideas and suggestions look more attractive.” (p. 1349)

The other authors present a diverse set of views and definitions of policy entrepreneurs. Biedenkopf states that policy entrepreneurs seek to “alter norms and behaviors.” (p. 1379) Pattberg suggests that governance entrepreneurs are “those individuals, groups of individuals and organizations that... aim at changing governance rather than policies or institutions.” (p. 1439) Along the lines of Kingdon, Mintrom and Luetjens argues that “policy entrepreneurs seize opportunities presented by changing broader conditions.” (p. 1365) Maor defines entrepreneurs by the different strategies they employ. Jodoin builds on domestic public policy works, defining policy entrepreneurs as those actors “who are

committed to policy change and possess particular skills and attributes.” (p. 1420) Reimer and Saerback suggest that entrepreneurs do not simply seek to shape the agenda, but also to advance their proposals toward policy formulation and implementation.

These definitions vary widely, but share two elements. First, policy entrepreneurs try to effect change; second, they use their agency to do so. Building on this, I suggest a definition of entrepreneurship that allows for precise identification of the ways in which it varies. Entrepreneurs are those that “punch above their weight”, using the resources and strategies available to them to achieve their desired outcome. This definition is not incommensurate with the others. Rather, it builds upon them to allow researchers to identify the range of resources and strategies, and the types of outcomes associated with entrepreneurship.

Importantly, this definition distinguishes the entrepreneur from the strategy she employs. Second, it makes reference to a specific outcome, which allows for comparison to other alternative outcomes *over specific time horizons*. These two moves help facilitate comparative work, and move us toward understanding the expansive effects of entrepreneurs.

If entrepreneurs are defined by their strategies, then being an entrepreneur is not the value that varies; rather, the choice of strategy does. As such, strategies should be distinct from the entrepreneurs that employ them. Strategies should be viewed as the causal mechanism that link actors to outcomes. Conflating these two categories makes it difficult to compare variables, since mechanisms will always be folded together, changing the definition of entrepreneurship according to the strategy employed.

Second, following Kingdon, a further refinement of the concept of entrepreneurship will specify the expected or desired outcome, so that it can then be compared to *alternative* outcomes. This helps to investigate the temporal dimension of entrepreneurship raised by a number of the papers. It is not enough to identify a policy change and then attribute it to successful entrepreneurs. Rather, researchers must specify the mechanisms through which changes are achieved and the time frame in which these changes are expected to occur.

Specifying the mechanism, time frame and outcome can help researchers gain further traction on what, exactly, is meant by a “policy change.” In some cases, it may be the adoption of a law or regulation. But in the context of climate governance, where there are many types of entrepreneurs functioning at multiple levels, policy changes may come in different shapes and sizes, at various points in the policy process. For example, Pattberg suggests four successive phases of entrepreneurship in which efforts at policy change are increasingly institutionalized. The culmination of entrepreneurship, according to this view, is incorporation into public regulations.¹ Similarly, in their discussion of REDD, Reimer and Saerbeck suggest that successful entrepreneurs do not merely place issues on the agenda, but move them through subsequent stages of the policy process, including the formulation and implementation of policies. These formulations suggest that policy change can be operationalized expansively—to span several different phases of the policy process—or more minimally, focusing on just one. Again, these dimensions speak to the importance of specifying what is meant by a policy change, and whether such a change must persist all the way through to the selection of a policy alternative, as in Kingdon’s model.

These dimensions also suggest the importance of identifying the *target* in the context of the definition. The target is the actor or person whose behavior the entrepreneur seeks to change. (Boasson and Huitema suggest that entrepreneurs can also defend the status quo; to me, such an effort is more consistent with classic interest group politics.²) Different goals require different targets, which in turn have different vulnerabilities. This is an important consideration in distinguishing among the approaches of various entrepreneurs.

In sum, these further refinements of the concept of entrepreneurship allow for data collection that facilitates comparative research. This requires separating the actors from the strategy that they employ. Moreover, the specification of alternative outcomes can allow a careful temporal investigation: when we know which outcome to look for, we can know when in the chain of events we should expect it. Note that this does not require a uniform definition. One could easily imagine that some policy entrepreneurs engage with domestic legislative processes, while others seek to influence policy at the intergovernmental level. Still others may focus entrepreneurship on firms' behavior. This variation is a reasonable reflection of the complexities of reality. We should not shy away from it, but we should *specify* the dimensions on which it occurs: strategies selected, and the time frame in which we expect to observe desired outcomes (or not).

In taking this approach, I heed Sartori's call for the need for an operational definition. He notes that "concepts are not necessarily variables [and] definitions are not necessarily operational" (Sartori, 1970: 1045). By identifying dimensions of variation, I hope to preserve the meaning of the concept set forth by the authors, and extrapolating an operational definition from them that is potentially usable by other researchers.

Toward a comparative approach

As noted above, the first order requirement for a robust comparative research agenda on policy entrepreneurship is a definition of entrepreneurs that produces clear and usable "data containers." In short, to select and compare cases, we need a certain amount of conformity on the independent variable (i.e. entrepreneurship).³

In addition, comparison requires the separation of the independent variable, entrepreneurs, from the causal mechanisms. One definition of causal mechanisms describes them as "portable concepts that explain how and why a hypothesized cause, in a given context, contributes to a particular outcome" (Falleti and Lynch, 2009: 1143). "Mechanistic" arguments emphasize the role of causal mechanisms, rather than simply independent variables, in ascribing causality: "causal effects depend on the interaction of specific mechanisms with aspects of the context within which these mechanisms operate" (Falleti and Lynch, 2009: 1144). One key task for the research agenda on policy entrepreneurship is to understand the relationship between mechanisms and context. Indeed, Boasson and Huitema point this out when they state that entrepreneurship is a "context specific" activity.

Strategies—including framing, coalition building, "softening up"—are causal mechanisms that link entrepreneurs to policy outcomes. Thus, it is critical to separate strategies from the actors who employ them, i.e. entrepreneurs. Without such a distinction, we cannot know whether outcomes are attributable to the policy entrepreneurs, nor make judgments on how to select on the independent variable—entrepreneurs. Eliding these two variables creates obstacles for a clear research design as well as for hypothesis testing. Maor defines entrepreneurs by the strategies they employ, distinguishing between norm, reputation, meaning and standards and performance entrepreneurs. While the identification of different strategies is useful, Maor elides the independent variable (the entrepreneur) with the causal mechanism (the strategy employed). This restricts the possible values of the independent variable to four (each of the strategies), which likely truncates full variation (King et al., 1994). This could potentially bias inferences drawn from hypotheses.

But, as the above definition of causal mechanism indicates, we must also investigate the interactions between mechanisms and the context within which they operate. In the case of

domestic policymaking, Kingdon describes the relevant context as the “policy soup.” It includes factors like the national mood, external events, changes in personnel, and whether there are open policy windows (Kingdon, 2002). In the intergovernmental and transnational arenas, researchers need to specify what the relevant contextual factors are, and why these, as opposed to others, should be considered.

It is a challenge of social scientific research to know which contextual factors matter. In quantitative research designs, this problem can be dealt with by controlling for certain factors. Inserting additional variables allows the analyst to hold them constant across cases to isolate the variables of interest. In qualitative research, this task is more difficult. Which contextual factors matter, and how does one know—especially when one cannot possibly consider them all? Answering this question requires an in-depth knowledge of the cases, and judgment on the part of the researcher.

This challenge is reflected in the papers in this special issue. Most focus primarily on actors and their strategies, with relatively less consideration of contextual factors. In part, this is the result of space constraints. However, a complete comparative picture will require further work on contextual factors that influence entrepreneurial success.

Certainly, the elements of the policy context could be endless in number, but some consideration of relevant dimensions on which the policy context might vary would facilitate further comparison. The papers suggest some preliminary dimensions. One is the *level of governance*. Clearly, there are strategies available to entrepreneurs at the transnational level that are not available to those at the sub-national level, and vice versa. A second dimension of the policy context might be the *presence or absence of various rules*. Biedenkopf, for example, demonstrates that the presence or absence of a federal emissions trading policy is an important contextual factor in determining the risk level for state governors—the group of policy entrepreneurs examine in her study. Similarly, Maor notes that CERES was able to promulgate new norms about firms’ environmental performance in part because there were few, if any, extant rules when they began their work in the mid-1990s. A third relevant dimension of the context is *other like-minded organizations*. As Reimer and Saerback note, a key part of the policy context in entrepreneurship around REDD+ was coalition building—a strategy necessarily dependent on the presence of other related organizations.

Thus far, I have offered two ways to amplify, and hopefully, clarify, the nature of entrepreneurship. First, I have suggested that we consider separately the resources and strategies available to entrepreneurs, and distinguish among different targets, and time horizons. Second, I have offered some potentially relevant components of the policy context to be considered in future work. In turn, I use this to create a simple causal model with similar—and therefore comparable—elements, in the hopes that this will help advance comparative study. The discussion thus far suggests the model depicted in Figure 1.

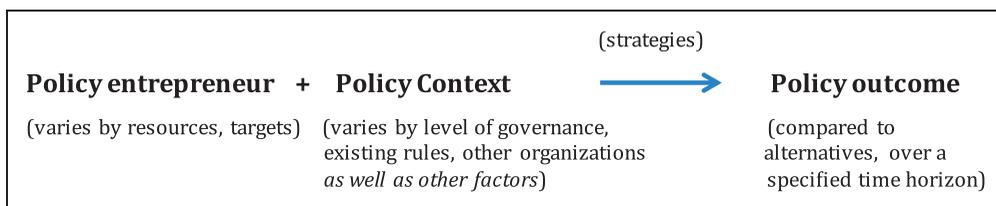


Figure 1. Causal model of entrepreneurship.

This model is admittedly a simple one, but then, all models are. As Ostrom notes, models are often used as metaphors, to “point to the similarity between one or two variables in a natural setting and one or two variables in a model” (Ostrom, 1990: 7–8). This simple model allows us to begin to compare. As Sartori notes, we cannot compare unlike things, such as stones as rabbits (Sartori, 1970: 1035). And we must not commit the error of making unlike things comparable so that we might compare them. This logic suggests that a model, such as the one below, can help ensure that we are indeed comparing like things. Moreover, it allows us to specify which elements should be added in order to hew more closely to reality. This might include additional intervening actors or processes, as well as feedback loops and multiple causality. While these more complex stories might more accurately reflect the political reality, their specificity precludes comparison. The goal of the model below, though overly simplistic, is to facilitate our collective thinking on what elements of entrepreneurship might be comparable, to begin to investigate the conditions under which it can be successful. The reality, of course, is much more complex; this is precisely why Ostrom warns against using models as the basis for policy prescription (Ostrom, 1990: 22).

Putting it all together: Hypotheses and next steps

Now that we have a clearer picture of what an entrepreneur is, the other possible relevant factors, and the causal mechanisms that link entrepreneurs to policy outcomes, we can turn to application of this theoretical framework to the problem of climate change. I begin with hypotheses that can be derived from the articles, based on my clarified causal model.

Hypotheses on targets

Only two of the papers investigate the question of targets in depth. Given that the choice of targets will certainly influence the likelihood success, understanding the dynamics between entrepreneurs and their targets is essential. Some targets are more likely to be swayed than others; and different strategies will be appropriate for different targets.

Biedenkopf demonstrates that variation in the establishment of emissions trading schemes in the United States is correlated with gubernatorial support. Her findings suggest that when the target of entrepreneurship is law or regulation, a large amount of government support is needed. Governors are the head of the state executive branch in the United States. They exercise a great degree of power in the legislative process. Without their support, Biedenkopf shows that efforts to implement emissions trading schemes have failed. Mintrom and Luetjens’ case study of the C40 Cities Climate Leadership Group demonstrates a similar pattern at a different level of governance. They suggest that proactive approaches to climate change at the *city* level were possible because of the lack of leadership at the state level. Jointly, these two cases suggest a proposition that could be tested across countries at varying sub-national levels of governance: *climate policies are more likely to be adopted and implemented when the executive branch is advocating for it*. A corollary, suggested again by both cases, is *climate policy entrepreneurs are more likely to be effective at lower levels of governance*. These hypotheses would allow for selection of cases where the executive branch both supports and opposes climate policies; ideally, we would try to control for some of the contextual factors identified above, such as the presence of similar organizations or relevant regulation.

Thus, we might compare the efforts of policy entrepreneurs in the state of Washington in the United States to the province of British Columbia in Canada. In 2008, British Columbia successfully introduced a carbon tax, now at CAN\$30 per ton, which is still in place. By

contrast, just last year, the state of Washington failed to pass a ballot initiative that would have created a similar tax. As a ballot initiative, the proposal did not come from the executive branch, but from interested policy entrepreneurs at the margins of the environmental advocacy community in Washington. In Canada, by contrast, the tax was supported by the Premier. In this case, policy entrepreneurship came from an unlikely corner: the US state of California. One account suggests that then Premier of British Columbia, Gordon Campbell, was influenced by the business-friendly environmental stance of California's governor, Arnold Schwarzenegger (Harrison, 2012). Comparison of these two cases, for instance, provides some preliminary evidence for the hypothesis about executive support.

Pattberg's study of carbon markets demonstrates that non-state actors have been successful entrepreneurs across several phases of the policy process. Unlike Biedenkopf, the targets of their entrepreneurship were not legislative, but rather aimed to change the behaviors of firms and other non-state actors. Similarly, Maor's discussion of CERES shows it was effective in changing firms' behavior. Taken together, these papers suggest another hypothesis for comparative research: *policy entrepreneurs are more likely to effect behavioral change when targets are non-state actors.*

Hypotheses on the policy soup

Kingdon's metaphor of the "policy soup" is useful in painting a general picture of the many elements that combine in surprising ways to produce policy changes. It is less useful in providing specific postulates about how these contextual factors vary and interact. The papers provide some generalizable hypotheses that could be further investigated in the context of climate change. As noted above, Biedenkopf underscores the importance of gubernatorial leadership in implementing emissions trading systems in the United States. Her research suggests another hypothesis: *Sub-national (i.e. at the state or provincial level) policy entrepreneurs are more likely to be successful in the absence of federal rules.*

Jodoin's work highlights the importance of considering interactions between scales of governance. These interactions, he argues, are a key factor in the success of REDD+ policy implementation. Specifically, transnational policy entrepreneurs are an important "enabling" factor in activating domestic policy constituencies and activities. Although different in its focus on policy entrepreneurs, this mechanism is consistent with Keck and Sikkink's work on the boomerang effect (Keck and Sikkink, 1998). Here, the broader hypothesis is: *effective domestic policy entrepreneurship is more likely when there are active transnational policy entrepreneurs.*

Hypotheses on strategies

Finally, many of the articles focus on the various strategies used by policy entrepreneurs. As noted above, it is important to underscore that strategies should be viewed as *causal mechanisms*, which connect the independent variable, policy entrepreneurs, to the dependent variable, policy change. Thus, any future comparative research must take care to separate out strategies from the actors who employ them.

Mintrom and Luetjens' study essentially compares different strategies, arguing that framing is, at bottom, a social process, best achieved through interaction among relevant parties. Frames generated through interaction are more likely to be consistent with values, and therefore to effect policy change. Successful entrepreneurs must understand both the

opportunities for change as well as the obstacles that exist within the “policy soup.” Interaction with relevant parties can only provide further information about context, increasing the likelihood of success. This argument is further supported by Reimer and Saerback, who suggest that coalition building facilitates sustained interest in a policy (which they term, “institutional anchoring”). Thus, a testable hypothesis (though one that would require further operationalization of the concept of interaction) would be: *ceteris paribus, entrepreneurs who engage in coalition building are more likely to effect policy change than those who do not.*

These hypotheses on climate policy entrepreneurs are drawn from the research presented in this volume. They are not meant to be exhaustive, but rather indicative of the types of comparative research that could be done moving forward. It is important to emphasize that any robust research agenda must examine both positive *and* negative cases of the dependent variable, as Boasson and Huitema also point out. We cannot commit the basic error of only studying successful policy entrepreneurs. If we are to have a fuller understanding of the conditions under which entrepreneurs effect policy change, there must also be work on cases when they fail to do so. The work in this special issue focuses largely on successes, which is a useful first step. But future work should include cases of failed entrepreneurship, which, unfortunately, might be difficult to detect. The carbon tax in Washington provides one useful example, and is an easy case to detect: there was a campaign, mounted by policy entrepreneurs, which sought to achieve a specific legal outcome. They failed to do so. But in other case, we might imagine that failed efforts are in effect, over before they begin. Thus, it may be hard to know that such efforts even took place.

Climate entrepreneurs and climate change: Toward the big picture

The preceding discussion has made a plea for conceptual and analytical clarity when discussing policy entrepreneurship as a critical first step for comparative research.

Comparative cases allow us to try to make inferences about the conditions under which entrepreneurship gives rise to successful policy change within a given context. Thus, we might learn about when state governments can implement carbon policies, or transnational actors can get cities to implement programs to promote mitigation and adaptation. This is an important contribution in and of itself. But ideally, we want to know if entrepreneurship can effect enough policy and behavioral change to make meaningful progress on slowing climate change.

To make the leap from individual cases of entrepreneurship to a more holistic evaluation of its collective impacts, we also need to consider *the expansive effects* of entrepreneurship. That is, in the most successful cases, entrepreneurs will punch well above their weight, having effects that move beyond the policy sphere in which they are operating. Considering the expansive effects of entrepreneurship means looking beyond the specific goal or target of an individual entrepreneur. Rather, it examines the extent to which entrepreneurship influenced a larger set of actors than originally intended, or helped catalyze broader effects. I describe these in further detail below. This is relevant to the case of climate change, where we want to know the collective contribution of policy entrepreneurship on mitigating emissions and implementing adaptation measures.

I suggest three types of expansive effects. First, policy entrepreneurship might give rise to demonstration effects. In this instance, entrepreneurs allow a policy that was previously considered infeasible to become feasible. For example, REDD is now considered to be a central component of the intergovernmental climate regime. However, this was not always the case. Indeed, when parties were negotiating the details of the Clean Development

Mechanism, the use of forestry offsets was extremely controversial, and thus, largely excluded. As a result of a large amount of work done by NGOs and private regulators in the voluntary market, forestry offsets are now a plausible policy instrument. This change is due, in large part to interactions between states and non-state actors involved in forestry (Green, 2018).

Second, policy entrepreneurship might give rise to normative changes. If policy entrepreneurs can effect changes in peoples' views about expected behavior, they can have far reaching effects. If we view changes in norms as the policy change of interest (rather than as a strategy, as some authors suggest), then entrepreneurs have the potential to extend the impact of their work. For example, Epstein describes how NGOs helped create an anti-whaling narrative, which, in tandem with other contextual factors produced a powerful new discourse. This new discourse transformed the whaling regime into an anti-whaling regime, where the vast majority of states respect a whaling moratorium (Epstein, 2008). The few that do not are ostracized.

The ability of actors to effect normative shifts is also well documented in the literature on transnational advocacy (see, e.g. Price, 1998; Tarrow, 1998). For example, Sikkink describes a "justice cascade" in which early prosecutions of state leaders who perpetrated human rights violations have given rise to a broader shift in world politics, promoting both democratization and human rights (Sikkink, 2011). The individual cases—trials of military regimes such as those in Greece and Chile—had a much larger effect on beliefs about human rights in the postwar era. The collective effect of these trials far exceeded those of an individual case, effecting a huge shift in the types of behaviors permitted by the world community.

The description by several of the authors of the rise of CDP suggests a normative shift. CDP began as the Carbon Disclosure Project in 2003 as a centralized repository for firms to report their carbon emissions. In their first year, 35 institutional investors, representing \$4.5 trillion in assets, reported to CDP.⁴ In 2014, the equivalent figures were 767 investors, representing \$92 trillion in assets. CDP did not merely offer a new set of disclosure standards; it contributed to a broader corporate norm of measurement and reporting.

Finally, entrepreneurship might have the expansive effect of changing governance practices. Pattberg's discussion of how private disclosure standards may be integrated into existing international public policy arrangements is an example of an expansive effect. For this reason, he refers to governance entrepreneurs who "aim at changing governance rather than policies or institutions" (Pattberg, 2017: 1439). To the extent that governance entrepreneurs facilitate the emergence of "meta-governance", as he describes, they also have an expansive effect. At this phase, a diversity of rules and practices "start to converge in terms of their core norms, organization principles and external communication" (Pattberg, 2017: 1440).

From the perspective of research design, studying expansive effects is a challenge. Essentially, we want to lengthen the causal chain to understand if entrepreneurs set social, political or economic processes in motion that had effects beyond their anticipated capacity.

One approach to evaluating the expansive effects of entrepreneurs is to ask the entrepreneurs themselves: were their efforts more successful than they had anticipated? However, there are likely to be internal validity challenges to such survey data. Retrospective and survey accounts can be inaccurate. This is likely due to the cognitive bias of entrepreneurs: they either believe that they are more successful than they are, or feel the pressure to demonstrate success to external audiences.

Thus, a more reliable approach to evaluating expansive effects would be to look to impartial measures of entrepreneurship. I suggest two. First, one might ask whether

entrepreneurs have impacted a broad swath of relevant actors, as defined by the “regulatory share.” That is, what proportion of potential regulatory targets *actually* change their behavior? This is particularly relevant for the myriad standard setting initiatives around climate change. For example, C40 Cities initiative seeks to reform the policies of cities. As the website points out, the 80 cities affiliated with C40 represent 550 million people. This sounds like a large impact, but roughly 3.5 billion people live in cities today. Thus, only about 16% of the relevant population is covered. In this view, the regulatory share of C40 cities is somewhat limited. But regulatory share is not only measured by the number of adherents, but also their relative importance. So, it is also relevant to note that although only about 16% of all city dwellers are covered by the C40 initiative, nine of the ten largest mega-cities are members.⁵ At first glance, this suggests that a key set of constituents is part of the regulatory share, since the largest cities, are almost uniformly participating. A number of works have described the importance of widespread participation, particularly for voluntary initiatives, to establish and enhance the legitimacy of the policy in question (Bernstein and Cashore, 2007; Green, 2014: chap. 5).

Second, we might look for changes in the law, when the law was not the intended target of policy entrepreneurs.⁶ “Legal incorporation,” is particularly important for climate entrepreneurship. Pattberg describes this as “integration into international public policy.” Elsewhere, I have described how the Greenhouse Gas Corporate Accounting Protocol was subsequently adopted by the International Organization for Standardization (Green, 2010, 2014: chap. 5). In this instance, a privately created standard was incorporated into public (or at least semi-public) global regulations. In other instances, countries have used some portions of privately carbon standards in their own carbon pricing regulations (Green, 2017). These are examples of the full institutionalization of entrepreneurship by non-state actors. Practices that were originally created outside the public realm have been incorporated into public rules and practices. To the extent that non-state climate entrepreneurs have more leeway to experiment with new approaches to problem solving (Abbott et al., 2016; Hoffmann, 2011), legal incorporation might be an important avenue for future efforts to combat climate change. Comparative work that examines the conditions under which legal incorporation occurs could provide a large contribution to understanding the potential scope of climate entrepreneurship.

Conclusion

Two recent events underscore the importance of understanding when and why climate entrepreneurship can be an effective engine for changes in policy, norms and behaviors. First, scientific evidence indicates that climate change is becoming more extreme. 2016 was the hottest year on record; nine of the ten hottest years in the last 136 have occurred since the turn of the century.⁷ Perhaps even more alarmingly, temperatures in the Arctic have recently soared to 20C above average, with historic lows in Arctic sea ice coverage.⁸

Second, in June 2017, US President Donald Trump announced his intention to withdraw from the landmark Paris Agreement, which entered into force on 4 November 2016. The US is the second largest GHG emitter globally. Although its withdrawal cannot likely be offset by the actions of individual entrepreneurs, it does make the need for climate policy entrepreneurship even more urgent.

There are some positive signs, which, interestingly, provide evidence for one of the hypotheses stated above: in the absence of federal rules, sub-national policy entrepreneurs are more likely to have success. In the week following Trump’s announcement, climate entrepreneurs launched into action. For instance, “We are still in” is a group of over

1000 governors, mayors, businesses, investors and colleges and universities across the US; they have declared their collective intention to continue to support climate policy and action to achieve the goals set forth in the Paris Agreement.⁹ The Climate Leadership Council, a voluntary group founded by major multinational firms, has gone even further, proposing a revenue-neutral carbon tax in the US as a way of cutting emissions.¹⁰ Firms such as BP, Exxon, Shell and Total are founding members. And Jerry Brown, the green-leaning governor of California, signed an agreement with China's Ministry of Science and Technology to work together with the Chinese on emissions reductions.¹¹ These recent developments provide anecdotal evidence for the hypothesis about the relationship between climate policy entrepreneurs and federal rules. More importantly, they provide reasons for optimism about the US's direction on climate.

Beyond the political winds in the US, the Paris Agreement has arguably institutionalized the demand for entrepreneurship. The "pledge and review" system set forth in the Agreement will require many actors to hold governments to account. In addition, the "catalytic and facilitative model" means that non-state actors of all stripes will also be essential to the successful implementation of the Paris Agreement, and ratcheting up state commitments the future. As Thomas Hale notes, "the Post-Paris climate regime sees sub/non-state actors not as an alternative to the UNFCCC process, or as merely a helpful addition, but as a core element of its logic" (Hale, 2016: 14). While not all non-state actors are policy entrepreneurs, and not all policy entrepreneurs are non-state actors, it is safe to say that this new institutional design, which incorporates sub/non-state actors, provides many opportunities for entrepreneurship. As researchers and academics, our charge should be to discover the conditions under which these new, and urgently needed efforts are most likely to contribute to our collective efforts to slow the rates at which we are changing the Earth's climate.

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Notes

1. Following the legal literature, Green and Auld (2017) refer to this as "incorporation by reference."
2. For an extensive review of the literature in American politics.
3. Of course, entrepreneurship could easily be a dependent variable, but the way it is defined by the editors, it is one element that helps explain climate governance.
4. www.cdp.net/CDPResults/cdp_report.pdf
5. Author's calculation based on www.ibtimes.co.uk/world-cities-day-ten-biggest-megacities-world-1526512 and C40 membership data available at www.c40.org/cities
6. If a change in the law is the target of policy entrepreneurs, then a successful change would be a direct, rather than expansive effect of entrepreneurship.
7. <http://climate.nasa.gov/vital-signs/global-temperature/> (accessed 19 December 2016).
8. <https://inside.org/arcticseaiceneews/> (accessed 19 December 2016).
9. <http://wearestillin.com/>

10. www.clcouncil.org/
11. www.theguardian.com/us-news/2017/jun/07/china-and-california-sign-deal-to-work-on-climate-change-without-trump

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