

Climate Change Law: Limitations of the Legal System to Respond to the Threats

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Abstract

From clean air regulations that affect cars and the transportation industry to government subsidies/incentives for renewable energy (solar & wind) to protecting the first amendment rights of scientists and journalists who maintain that climate change really exists and is caused by human activity, the American legal system is an integral part of the response to climate change and the public policy of sustainability and resilience. The importance of legal rules to deal with the threats posed by Climate Change cannot be overstated. At the federal, state and local levels of government regulations reducing air pollution and controlling energy that increases greenhouse gases, taxes on emissions, required insurance on flooding hazards and the like have been enacted to deal with Climate Change by reducing the causes and by adapting to reduce the physical risks to promote resilience. Yet, the U.S. legal systems has limitations that affect the impact. Legislation requires a political situation supporting regulation of the causes of climate change, financial support for alternative fuels and the will to develop and get laws passed that will be effective and acceptable to political bodies. Then there are the courts. Litigation is a slow process and the law created by appellate cases or federal district court decisions may be narrow and not comprehensive. Additionally, there are arguments that the public policy reflected in statutes, regulations and court decisions may not be based upon valid economic analysis. In a capitalist environment the response of business may be critical not only because of the severe limits of the legal system but also because government alone cannot work to meet the basic goals of dealing with the threats of climate change.

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Introduction

The perspective of this article is that of the attorney¹ for a business client that should know about risks of climate change and ways to adapt and be resilient.² This article begins with the notion that climate change is real. Bill McKibben's article identifies serious threats to humanity³ and Vollman, W.T. (2018). *Carbon Ideologies*, reviewed by Rich, N. offers no comfort.⁴ Climate change skepticism which has an impact on public policy that is the basis for development of law⁵ is a worry.

The law developed to respond to climate change includes law seeking to mitigate climate change by controlling emissions of CO₂- greenhouse gas and by government incentives for renewable energy. The Clean Air Act is an example of mitigation. Other laws deal with the threat of climate change by requiring or supporting adaptation to climate change to achieve resilience. An example of adaptation to threats of sea level rising and flooding by encouraging retreat of people and communities from threatened areas is the Biggerts-Waters Flood Insurance Reform act of 2012 that amended the federal flood insurance by eliminating the taxpayer subsidies to premiums paid by landowners⁶ but the enforcement of that law has been deferred since it was to take effect in April 2014!

Most legal experts agree that laws meeting both public policy goals of mitigation and adaptation to climate change are needed.⁷ Some advise manufacturing a cooler climate through geoengineering described by the Royal Society in 2009. Indeed, even environmental law scholars like Ruhl, J.B. expect that it will be adaptation law, recognizing that there is no way to avoid climate change, which will "push back on environmental law as we know it."⁸

Economics and role of business in dealing with threats of climate change deserves our attention

Learning that there are businesses that recognize the threats of climate change and that plan to support both mitigation & adaptation with or without legal requirements is

¹ Dernbach, J.C. (2013). Lawyering as if tomorrow matters. Retrieved from <http://ssrn.com/abstract=3068735>.

² Hammond, C. (2013). The evolving role for the transactional attorneys responding to client needs in adapting to climate change. *John Marshall Law Review*, 47, 543-607.

³ McKibben, B. (2018 November 26). How Extreme Weather is Shrinking the Planet. *New Yorker*. Retrieved from <https://www.newyorker.com/magazine/2018/11/26/how-extreme-weather-is-shrinking-the-planet>

⁴ Rich, N. (2018 October 16). The most honest book about climate change yet. *The Atlantic*. Retrieved from <https://www.theatlantic.com/magazine/archive/2018/10/william-vollmann-carbon-ideologies/568309/>

⁵ Wang, J., & Kim, S. (2018). Analysis of the impact of values and perception on climate change skepticism and its implication for public policy. *Climate*, 6(4), 99. <https://doi.org/10.3390/cli6040099>

⁶ Hammond, C. (2013). The evolving role for the transactional attorneys responding to client needs in adapting to climate change. *John Marshall Law Review*, 47, 543-607.

⁷ Sokol, K. (2013). Possibility of climate manufacturing and the need for global governance. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2320513

⁸ Ruhl, J.B. (2018 November 15). Preparing environmental law for the climate dystopia. *Environmental Law Prof Blog*. Retrieved from https://lawprofessors.typepad.com/environmental_law/2018/11/preparing-environmental-law-for-the-climate-dystopia.html

a very positive experience. The legal system alone will not be able to deal with climate change either in slowing its development by mitigation or in dealing with the disasters it causes (wildfires, sea level rising, etc.)⁹ by adaptation.

Businesses of all kinds are growing aware of risks posed by climate change.¹⁰ Owners, users and developers with interests in real estate are obviously affected by disasters caused by climate change. So are their investors and their lenders and all sorts of insurers. So are other types of businesses in all fields of endeavor. Additionally, the role of specific industries contributing to climate change is becoming clearer. News of industries as diverse as global textile production (that generates more greenhouse gas emissions than do international maritime shipping and aviation combined)¹¹ and the travel industry (not only transportation but hotels and tour operators allegedly are responsible for between 5 and 10% of the world's carbon emissions)¹² and utilities providing energy (in California liability for damages from wildfires is being challenged by utilities who blame climate change)¹³ all recognize their special impact.

Some businesses are even taking advantage of opportunities to respond to climate change, through the redevelopment of infrastructure and investment in new energy and insurance products. A recent article in Bloomberg's Businessweek reported how a top investment strategist for JP Morgan Asset Management advised clients of the dire reality of sea level rising that would threaten 40% of Americans BUT still foresaw some business opportunities!¹⁴ For example, it listed sea "walls costing \$2.7 million per meter" as one opportunity. According to this view businesses need to be aware of costs of adaptation both as a risk if affected directly by one of the threats like water rising and as an opportunity to protect others from the threat.

At a minimum businesses need to develop information about the type of risks, the extent of risks, the likelihood of risks, the ability to avoid the risks and the costs associated with risks caused by climate change. This is a tall order. Yet, businesses no longer hide their corporate heads in the sand about the reality of climate change. The shareholders who "own" the businesses are becoming activist at least in their demand for information and disclosure about the risks of climate change to their investments.

Indeed, it is becoming clear that business and the economic interests of their owners will have a broad role and/or function in demanding reduction of GHG emissions to avoid catastrophes to the entire world economy. These may become the moving force, the leaders in demanding integration of individual efforts and those of

⁹ Corelogic. (2018 August 22) 48,000 homes in Hawaii threatened by hurricanes. Corelogic (2018 November 12). 48,390 Homes at high risk from destructive California wildfires.

¹⁰ Dernbach, fn. 43: Stern, N. (2007) *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University press. doi:10.1017/CBO9780511817434

¹¹ Tramuta, L. (2019 January 1). Beautiful and sustainable big players in one of the planet's most polluting industries are finally getting serious about their environmental responsibilities. *Fortune*, p. 49.

¹² Vora S. (2019 January 6). Travel Industry uniting to fight climate change. *Honolulu Star-Advertiser*, p. travel.

¹³ Chediak M. (2018 August 20). Don't blame us, blame climate change. *Bloomberg Businessweek*, p. 16.

¹⁴ Flavell, C. (2018). Climate change will get worse- bet on it, *Bloomberg Businessweek*, pp. 24-26.

government. In the United States the RISKY Business Project provides a good look at economic risks of climate change in its detailed report in 2014.¹⁵ It alerted many to a “range of potential consequences for each region of the US...” It focuses on three of the clearest and most economically significant risks: 1) damage to coastal property and infrastructure from rising sea levels and storm surges; 2) climate driven changes in agricultural production and energy demand and 3) the impact of higher temperatures on labor productivity and public health.

According to its Executive Summary, a goal of the report is to promote a “standard practice for American business and investment community to factor climate change into its decision-making process.” It judges that “business still tends to respond only to the extent that these risks intersect with core short term financial and planning decisions.” It hopes for a more active role for American businesses including helping government determine how best to react to risks and costs of climate change and how to set the rules that move the country to more sustainability.

The awarding of the 2018 Nobel Memorial Prize in Economic Sciences to William Nordhaus shows a recognition of the economic perspective on climate change. Nordhaus has spent four decades trying to convince government to address climate change especially by imposing a carbon tax. Nordhaus decried the reaction of the current president: “It’s hard to be optimistic. And, we’re actually going backward in the US with the disastrous policies of the Trump administration.”¹⁶

Development of law in the U.S.

Before explaining the limitations of the legal system to respond to the threat of climate change, a simple, basic look at how law develops generally in US will be useful. Thereafter this article will review how the law has responded to the fact of climate change by mitigation, adaptation, and even manufactured climate change.

In the United States there is an underpinning of the Common Law that followed the early English emigrants to America. The American legal system relies on development of legal precedent by appellate courts that review decisions of trial courts about disputes. Courts follow the existing common law rules until such courts determine that new legal principles are needed to deal with particular facts of the case in light of current societal public policy goals.

While the Common Law as enunciated by appellate courts provides a default rule of law, legislative bodies locally in cities and towns, state wide and nationally in the House of Representatives and U.S. Senate may alter the Common Law when the latter does not deal adequately with societal needs.

¹⁵ Bloomberg, M. (2014 June). Risky business: the economic risks of climate change in the United States: A Climate Risk Assessment for the United States. Retrieved from https://riskybusiness.org/site/assets/uploads/2015/09/RiskyBusiness_Report_WEB_09_08_14.pdf. Houser, T., Hsiang, S., Kopp, R., & Larsen, K. (Eds.) (2015). *Economic risks of climate change: an American prospectus*. New York, NY: Columbia U Press.

¹⁶ Appelbaum, B. (2018 October 9). Economics of climate change and innovations, *The New York Times*, p. A7.

Moreover, because of the importance of the three branches of government in the American legal system, legislation requires the approval of the executive branch. The executive branch, whether the president of the United States, the governor of a state, the mayor of a municipality or even administrative agencies at all levels to which powers to enforce the legislation have been delegated, has an important function in the developing the rule of law through legislation.

Finally, legislation is subject to review by the judiciary in light of laws and underlying constitutional principles. Global rules to which the U.S. becomes bound are approved by the US Senate in the form of treaties

There are limitations of the legal system that affect the success of it responding to the threats of climate change.

Legislation requires a political situation to support the laws. Even if you have that, it requires money. And identity based conflicts of the sort that have become more acute since the 2016 elections interfere with developing a coherent public policy on climate change. Indeed, research by Wang, J. & Kim, S. reports that significant declines in climate change beliefs, risk perceptions and trust in scientists in the U.S. have occurred. From a political perspective, the great difference between Democrats, 72% of whom believe that “changing temperatures are due to human-induced climate change,” as compared with Republicans, only 27% of whom hold that view, suggests why legislation is difficult to enact.

Peck, A. considers how the insights of peace and conflict studies researchers to move past such identity- based conflicts that threaten to bring lawmaking to a standstill”¹⁷ may be useful. In this period of skepticism and denial Lucas, G. and Mormann, F. argue that we need prediction markets to sway public policy to achieve acceptable resulting law. Their research deals with the problem of policy makers in deciding which policies are best suited to “tackle the enormous challenges presented by our changing climate” in preparation for legislative proposals.

After reviewing and criticizing four decision making mechanisms that commonly are used by legislators,¹⁸ Lucas, G. & Mormann, F. recommend using the same prediction market techniques that have forecast election results, economic trends and Oscar winners. Using group deliberations, peer review, cost benefit analysis and expert surveys, market participants would bet on important climate outcomes conditioned on the adoption of particular policies. They expect that this approach to policy making might also “overcome resistance to climate change mitigation efforts, particularly among market-oriented conservatives.”

Passage of laws by legislators depends on the politics at any particular time. Legislation to deal with climate change will not be enacted when current political support is lacking. And because of the role of the executive branch in the American government system, federal legislation cannot be enacted without support of the

¹⁷ Peck, A. (2018). Identity-based conflicts in public policy: hydraulic fracturing Pennsylvania. *University of Pittsburgh Law Review*, 79(3), 437-509. DOI: 10.5195/lawreview.2018.567

¹⁸ Lucas, G. & Mormann, F. (2018). Betting on climate policy: using prediction markets to address global warming. Retrieved from <https://ssrn.com/abstract=3178337>.

president. (Unless a large percentage of both houses of Congress overturns the president's veto).

In the U.S. legal system, rules also are made by administrative agencies to which a statute or ordinance specifically delegates a legislative function to implement the statute or ordinance. Because leadership of administrative agencies are determined by the executive branch, a president may interrupt enforcement of climate change statutes by failing to enforce administrative rules and even by changing those administrative rules. The New York Times reported that "New E.P.A. Plan Could Free Coal Plants to Release More Mercury into the Air" in its referral to revision of the underlying reasons that the Obama administration used to justify restrictions on mercury emissions from coal in 2011.¹⁹ And, of course, the recurring budget crises that are being used as the reason for a near total shutdown of the federal government interfere with the administrative agency work.

Litigation as the creator of law is a slow, narrow process. Often litigation is begun with a goal of avoiding clear statutory or common law. Thus, litigation may challenge the constitutionality of a statute or, more likely, seek an interpretation or application of a statute, sometimes to undercut the public policy that responds to climate change in the first place. And, because of the vagaries of our appellate court system that determines the Common Law and interprets the statutory law, litigation results in unclear and inconsistent rulings.

Craig, R.K. provides details of litigation brought in eight cities and counties in California regarding the impact of sea level rising.²⁰ The procedural moves include removing cases from state courts to federal courts and identifying the cause of action as in state tort law or the federal common law often with conflicting results. And, in an effort to support the defendants in all eight law suits, the Competitive Enterprise Institute (CEI) and the National Association of Manufacturers (NAM) asked the Securities and Exchange Commission (SEC) to investigate whether the local government plaintiffs violated SEC law by withholding information about their vulnerability to sea level rising when those local governments issued and sold municipal bonds.²¹ Indeed in reflection on the limitations of litigation as a developer of the law, a prominent jurist, Judge Richard Posner of the federal 7th Circuit Court advised a group of Chinese judges to avoid adoption of the Common Law approach of the American and the English system. He urged China to instead adopt the bureaucratic approach to developing law of the Civil Law countries²²

And litigation initiated by the executive branch of the government, whether by the Justice Department of the President of the U.S. or the attorney general of a state, may seek to negate the positive common law and/or legislation that has been enacted to

¹⁹ Friedman, L. (2018 December 28). New E.P.A. plan could free coal plants to release more mercury into the air. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/12/28/climate/mercury-coal-pollution-regulations.html?em>

²⁰ Craig, R.K.(2018). California climate change lawsuits: can the courts help with sea-level rise and who knew what when? Retrieved September 2018 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3225312.

²¹ Craig, R.K. (2018). California climate change lawsuits: can the courts help with sea-level rise and who knew what when? Retrieved September 2018 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3225312

²² Video of his lecture on file with author January 22, 2019.

deal with climate change. So it is a mixed bag. The bottom line is that the rule of law that is supposed to support the protection of society may fail to achieve that goal in a timely way.

In a market /capitalist economic system, the response of business to climate change is critical.

The economic risks of climate change are important motivators²³ for business in the US. Both the law and organizations, like CERES reflecting shareholder and other stakeholder interests, emphasize business disclosure of climate change risks because of a belief that investors will notice such disclosures as they make investment decisions and because investors are entitled to know as they invest. The administrative regulations of the Securities and Exchange Commission (SEC) require companies to disclose risks that may affect their business/profit. In 2010 those regulations were expanded to require disclosure of risks associated with climate change.²⁴ The four categories of impacts that could trigger disclosure obligations include: “1) newly enacted or pending greenhouse gas laws and regulations; 2) treaties and other international accords; 3) indirect consequences and business trends brought on by climate change; and 4) the physical effect of climate change.”²⁵

Still criticism of the SEC requirements stems from not broad enough disclosure requirements and a lack of enforcement of the administrative agency regulations. And as Kirsch & Custer conclude, “[I]t is important to remember that determining whether making an environmental disclosure is required is only the first step.” Unless investors and management of companies see sufficient value in mitigation of or adaptation to climate change, the information alone will not respond adequately to the threats. Sjaafjell, B. describes a Sustainable Governance Model that can provide guidance on how to integrate sustainability into the decision making of corporate boards and which can be the basis for law reform proposals.²⁶ Fisch, J.E. provides the argument for a broader “Sustainability Disclosure” that would not leave the decision of what is “material” enough to warrant a disclosure to the company and would not limit enforcement to the SEC because the latter’s enforcement is “vulnerable both to political pressures and shifting administrative priorities.”²⁷

The need to communicate about climate change and its importance to business and the markets cannot be overstated.

²³ Houser, T., Hsiang, S., Kopp, R., & Larsen, K. (Eds.) (2015). *Economic risks of climate change: an American prospectus*. New York, NY: Columbia U Press.

²⁴ Kirsch, R.C. & Custer, N.B., (2013). Disclosure of environmental liabilities: sec obligations, auditing standards, and the effect of Sarbanes-Oxley. *SU035 ALI-ABA 2055 The Impact of Environmental Law on Real Estate and Business Transactions: Brownfields & Beyond. American Law Institute-American Bar Association (ALI-ABA)*, Volume 2.

²⁵ Kirsch, R.C. & Custer, N.B., (2013). Disclosure of environmental liabilities: sec obligations, auditing standards, and the effect of Sarbanes-Oxley. *SU035 ALI-ABA 2055 The Impact of Environmental Law on Real Estate and Business Transactions: Brownfields & Beyond. American Law Institute-American Bar Association (ALI-ABA)*, Volume 2.

²⁶ Sjaafjell, B., (2018). Beyond climate risk: integrating sustainability into the corporate board. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3279316

²⁷ Fisch, J.E., (2018). Making sustainability disclosure sustainable. Retrieved from https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=3000&context=faculty_scholarship

Solutions must come from the markets which are the most powerful organizing institution on earth. Hoffman, A. of the Business School at University of Michigan points out that climate change brings market shifts from the systemic risks that affect the entire economy to more specific risks to certain industries and sectors.²⁸ His examples of the shifts include:

- Regulatory changes that can alter the price of carbon that may affect many levels of the business from production to transportation
- Financial markets shifts due to investors and shareholders considering the issue of Climate change in relation to asset decisions.
- Risk management shifts e.g. with insurance and reinsurance a company considers as it evaluates physical, financial and disclosure risks posed by climate change and
- Consumer shifts with demand moving to products that are less wasteful and more energy efficient even when the motivation may be more economic than altruistic.

Hoffman points out that he is not looking at Corporate Social Responsibility (CSR) or the morality of what a corporation should do, but rather the response to business constituents who bring concerns about climate to the corporate agenda. Hoffman stresses that the solutions to climate change must come from business. It does not matter whether business leaders and investors are “agnostics about the science of climate change.” They must see it as a “business issue.”

This is all consistent with the research of Petersen, H.L. & Vredenburg, H. who found that investors in and the management of businesses espousing CSR are motivated by a belief that CSR adds economic value to the firm. There is no inherent/necessary conflict between a business goal to mitigate and/or adapt to climate change and the basic goal of business to increase profits.²⁹ It is with this prominent role of businesses of all sorts that the most effective response to the threats and destruction caused by climate change can occur. Actually, this should be no surprise.

Conclusion

In reaction to the limitations of public law dealing with threats of climate change, the question of what rules, even if not rules of law, can be developed and how they can be developed to respond to the threats looms. The process and the results should and must be consistent with the business forces. Although a solution is beyond the scope of this article, it is worthwhile to identify and consider some of the possibilities.

In 2005 Orebeck, P., Bosselman, F., Bjarup, J., Callies, D., Chanock, M. & Petersen, H. argued for a new evaluation of customary law, a “bottom-up-system” that would

²⁸ Hoffman, A.J. (2016). Communicating about climate change with corporate leaders and stakeholders. Retrieved from http://deepblue.lib.umich.edu/bitstream/2027.42/117584/1/1313_Hoffman.pdf

²⁹ Petersen, H. L., & Vredenburg, H. (2009). Morals or economics? Institutional investor preferences for corporate social responsibility. *Journal of Business Ethics*, 90(1), 1-14. doi: 10.1007/s10551-009-0030-3

play an important role in sustainable development of the land.³⁰ Although sustainability itself may no longer be enough of a goal for the planet, it does offer a recognition that the use of natural resources should be guided/restricted by a common sense approach. How to identify that common sense and implement it as a rule challenges us still.

Kenny, B., Vredenburg, H., and Lucas, A., offer a new role of law to reconcile economic development, environmental protection and entrepreneurship in the energy industry.³¹ In describing “reflexive law,” they suggest that rather than a rights based approach that only considers whether technical legal standards will be met by business, an interest based proactive approach considering the stakeholder concerns would be a more effective approach to meeting the complex goals that must be considered in the context of climate change. Indeed, as they describe reflexive law, it would take elements of responsible institutional decision making that are based upon the kind of information generation and exchange that the disclosure rules of the American SEC require.³² Reflexive law ideas respond to the “challenges of how to ensure that the rules governing society can adapt effectively in complex and turbulent times.” Kenny, Vredenburg and Lucas conclude that this reflexive law process may be effective to meet challenges companies face when “operating in this complex business environment ...where significant gaps in public policy leave a wide range of unresolved issues to contend with.”³³

In 2007 Vandenberg, M.P. shared his studies of Private Environmental Governance (PEG).³⁴ His work on how this approach can work in response to climate change follows work by Hardin, H.³⁵ who explained why private control over public resources would not be effective and Ostrom, E. who described how communities “can collectively, and with external government force, manage natural resources.”³⁶ Galperin, J.U. defines the word, “private” as a description of the locus of decision-making: non-governmental.³⁷ Apparently, Galperin and Vandenberg agree that

³⁰ Orebeck, P., Bosselman, F., Bjarup, J., Callies, D., Chanock, M., & Petersen, H. (2006). *The Role of Customary Law in Sustainable Development*. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511550621

³¹ Kenny, B., Vredenburg, H., and Lucas, A. (2012). The new role of law in stimulating industrial innovation and regional development: the Canadian experience with reflexive law in reconciling economic development, environmental protection and entrepreneurship in the energy industry. *International Journal of Innovation and Regional Development*, 4(1), 8-27.

³² Kenny, B., Vredenburg, H., and Lucas, A. (2012). The new role of law in stimulating industrial innovation and regional development: the Canadian experience with reflexive law in reconciling economic development, environmental protection and entrepreneurship in the energy industry. *International Journal of Innovation and Regional Development*, 4(1), 8-27.

³³ Kenny, B., Vredenburg, H., and Lucas, A. (2012). The new role of law in stimulating industrial innovation and regional development: the Canadian experience with reflexive law in reconciling economic development, environmental protection and entrepreneurship in the energy industry. *International Journal of Innovation and Regional Development*, 4(1), 8-27.

³⁴ Vandenberg, M. P. (2007). The new wal-mart effect: The role of private contracting in global governance. *UCLA Law Review* 54(4), 913-970.

³⁵ Hardin, G. (1968) The tragedy of the commons. *Science*, 162(3859), 1243-1248. DOI: 10.1126/science.162.3859.1243

³⁶ Galperin, J. (2018). Private, environmental, governance. *George Washington Journal of Energy and Environmental Law* 9(1), 1-4.

³⁷ Galperin, J. (2018). Private, environmental, governance. *George Washington Journal of Energy and Environmental Law* 9(1), 1-4.

governance is “a restriction on behavior” where the limits can arise from a number of sources including public law, private law and community norms.

Vandenbergh’s recent article uses a case study of global civil aviation sector as an industry where PEG could be used to fashion guidance, or “a private governance agenda,” with examples of the initiatives that might be included.³⁸ That industry clearly contributes to greenhouse gas emissions as well as experiences the disasters to which it must adapt to achieve resilience. Yet based upon review of the past few decades and the current political climate, Vandenbergh does not expect government to deal with the problems. He recognizes that although private governance initiatives are an option, they “are not a first-best response.”³⁹ They cannot get a decline in large scale emissions which a carbon tax could, but they are a second-best approach because in the short term they may bypass the barriers to government action and achieve at least some important mitigation results.⁴⁰

Given the limitations of law in the US to respond to climate change, scholars like those mentioned will provide a basis for new approaches that incorporate discussions with businesses and other stakeholders.

³⁸ Vandenbergh, M.P. & Metzger, D.J., (2018). Private governance response to climate change: the case of global civil aviation. *Fordham Environmental Law Review*, 30(1), 62-110.

³⁹ Vandenbergh, M.P. & Metzger, D.J., (2018). Private governance response to climate change: the case of global civil aviation. *Fordham Environmental Law Review*, 30(1), 62-110.

⁴⁰ Vandenbergh, M.P. & Metzger, D.J., (2018). Private governance response to climate change: the case of global civil aviation. *Fordham Environmental Law Review*, 30(1), 62-110.

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Houser, T., Hsiang, S., Kopp, R., & Larsen, K. (Eds.) (2015). *Economic Risks of Climate Change: an American Prospectus*. New York, NY: Columbia U Press.

Kenny, B., Vredenburg, H., and Lucas, A. (2012). The new role of law in stimulating industrial innovation and regional development: the Canadian experience with reflexive law in reconciling economic development, environmental protection and entrepreneurship in the energy industry. *International Journal of Innovation and Regional Development, 4(1), 8-27*.

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