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MEASURING OUR INVESTMENT IN THE CARBON STATUS QUO: CASE STUDY OF NEW OIL DEVELOPMENT IN THE RUSSIAN ARCTIC

Roman Sidortsov

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INTRODUCTION

For thirty years, climate change has played an ever-increasing role in the public policy agenda. If we are to separate climate change talk from the actual carbon emissions data, an unpleasant picture emerges: greenhouse gas (GHG) emissions continue to rise. From 1990 to 2005, global GHG emissions grew by 26%.1 Carbon dioxide emissions increased by 31%

during the same period.\textsuperscript{2} The rise in CO\textsubscript{2} emissions is especially noteworthy because they constitute 77\% of all GHGs.\textsuperscript{3} Energy-related CO\textsubscript{2} emissions, which provide the greatest contribution—65\% of all global anthropogenic GHG emissions\textsuperscript{4}—have increased globally by over 40\% between 1990 and 2008.\textsuperscript{5}

To date, the effort to mitigate climate change has largely focused on reducing the demand for fossil fuels by targeting carbon emissions.\textsuperscript{6} This approach, which served as the foundation for essentially every carbon reduction scheme from the Kyoto Protocol to Germany’s environmental tax reform, has been based on seemingly solid logic: reduction in demand (i.e., CO\textsubscript{2} emissions) will lead to a reduction in supply (i.e., fossil fuels). Unfortunately, this approach, when applied, has significant flaws. The logic behind it only works if carbon emission controls are truly universal. Otherwise, fossil fuels, no matter where extracted, will find their way to a country where they can be “converted” into CO\textsubscript{2} without any constraint imposed by law. To remedy this monumental flaw, more than 190 nations at the COP17 meeting in Durban, South Africa agreed to begin the process for creating a new climate agreement that adopts universal controls.\textsuperscript{7}

A failure to reconcile fossil fuel production, including oil production, with the impact of the extracted fossil fuels on climate change may put the new climate agreement in jeopardy. The carbon emissions curve follows the global increase in production of oil and other fossil fuels.\textsuperscript{8} In the case of oil, this should not come as a surprise—almost all extracted crude ends up in

\begin{itemize}
  \item Id.
\end{itemize}
internal combustion engines and, eventually, in the atmosphere in the form of GHGs. The status quo is unlikely to change as long as oil remains the backbone of the world’s economy. In fact, according to several forecasts, oil demand and, thus, production will be on the rise for several decades. Significant financial investments will be required to accommodate this trend. Investments in oil production are often heralded as the means of achieving important and even noble goals, such as providing jobs and ensuring energy independence. However, there is another dimension of investing in seismic studies and productions platforms—every dollar creates a financial incentive for keeping the economy’s carbon content high and GHG emissions steady. This financial “rut,” known in literature as “carbon lock-in,” sets the course for a painful collision between the chosen economic path and the reality of climate change that is already too dangerous to ignore.

Offshore oil development in the Russian Arctic serves as a perfect case study for this paper. Largely undeveloped Arctic oil and gas resources make the region the world’s last energy frontier. Exploration and exploitation of these resources will require massive financial investments and extensive development of supporting infrastructure. Therefore, development of

12. INT’L ENERGY AGENCY, supra note 11, at 444.
14. Sidortsov, supra note 6 (manuscript at 10–11).
16. According to Russian leadership, the alliance between ExxonMobil and Rosneft to explore deposits in the South Kara and Black Seas may lead to a total investment of $500 billion. Yuriy Humber
Russian Arctic oil fields will have considerable geo-political, socio-economic, and climate change implications.

This paper focuses on a proposed stock-swap deal between British Petroleum (BP), the British oil supermajor, and Rosneft, the Russian oil champion, to jointly develop a vast area covering 125,000 square kilometers in the South Kara Sea.17 The announcement of the BP-Rosneft deal represented, according to many, the commencement of exploration of the last energy frontier.18 When the parties failed to close the agreement and Exxon took over as the Rosneft’s partner in August 2011, BP became a subject of severe criticism by some business media outlets.19 Such publications described the British oil giant’s failure to enter the Russian Arctic in words usually reserved to significant misfortunes.20

This paper questions this rather one-sided point of view and suggests that BP’s stakeholders may be better off not joining the economically and environmentally questionable Arctic venture. The overarching goal of this paper is to introduce a decision-making tool that helps to support the aforementioned challenge by quantifying an investment’s dependence on carbon emissions. The proposed decision-making tool, Carbon Dependence of Investment (CDI), calculates carbon emissions that need to be emitted over a period of time to avoid economic loss. The first section of this paper explores the proposed climate change mitigation controls that target fossil

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18. Foley, supra note 17. The South Kara Sea project is not the first attempt to explore hydrocarbon resources in the Arctic. For example, Statoil and Eni are currently developing the Goliat oil field in the Barents Sea (The field is projected to go onstream in November 2013). Norway, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/countries/cab.cfm?fips=NO (last updated Aug. 2011). Another example is the Prirazlomnoe oil field in the Pechora Sea. First discovered in 1989, it is scheduled to start commercial production in 2012. Prirazlomnoe Oil Field, GAZPROM, http://www.gazprom.com/about/production/projects/deposits/pnm/ (last visited Apr. 9, 2012).
20. Sibun, supra note 19; Chazan, supra note 19.
fuel production. The second section explains why targeted transparency (disclosure) may be the most effective form for such controls. The third part of this paper introduces CDI. In particular, this section contrasts CDI with the total emissions analysis, describes the temporal aspect of the CDI analysis, and describes differences between CDI and other “carbon assessment” tools. The fourth part of the paper identifies possible applications of CDI disclosure and potential challenges of CDI implementation.

I. EXISTING CLIMATE CHANGE MITIGATION PROPOSALS TARGETING FOSSIL FUEL PRODUCTION.

As mentioned above, the global climate regime is currently in a position to ensure that CO₂ concentration remains at 450 ppm. Thus, until the international community adopts universal controls or comes up with an alternative or complementary approach, it is very likely that global GHG emissions, including energy-related emissions, will continue to rise steadily. Harnessing the climate change problem at the point of fossil fuel production should be on policymakers’ radars because it compensates for the lack of universal control on global emissions.

Unfortunately, the best-known policy proposals that focus on limiting fossil fuel production suffer from the same problem as the current climate change regime—political feasibility. “[R]eaining fossil fuel reserves should not be exploited without a plan for retrieval and disposal of resulting atmospheric CO₂,” concluded a group of scientists lead by James Hansen in a paper entitled Target Atmospheric CO₂: Where Should Humanity Aim?21 The authors of Cap & Share: A Fair Way to Cut Greenhouse Emissions turned the statement into an epithet for their alternative to the Kyoto regime.22 According to the proposal, all global emissions should be capped on an annual basis.23 National caps would be determined based on the population of each country.24 “National carbon protection trusts,” national agencies responsible for domestic implementation of Cap and Share, would distribute individual permits or pollution authorization permits (PAPs) to all

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adults. People will then sell their PAPs to authorized financial institutions at a current market rate. The institutions will resell PAPs to fossil fuel producers. The producers will then be allowed to produce and sell fossil fuels pursuant to the emissions quota derived from the PAPs they purchased.

A similar Cap and Dividend proposal is also based on an upstream cap, effectively limiting fossil fuel supply. Under the Cap and Dividend proposal, the pollution permits would be auctioned directly to fossil fuel producers. The producers will then be required to return the proceeds from the auction through a non-profit trust to individuals. Cap and Dividend proponents claim that their system is efficient and would not require a large bureaucracy. Kyoto2 is another upstream cap-based proposal. Unlike Cap and Share and Cap and Dividend, this proposal also includes controlling emissions that are “close” to the point of production (e.g., cement plants). Kyoto2 proposes distributing pollution permits at a global auction and using direct regulation when the market mechanisms fail or “create unnecessary cost.”

Oliver Tickell, the author of Kyoto2, pointed to the success of the Montreal Protocol at combining market mechanisms and direct regulation in the leaflet Kyoto2 in a Nutshell, distributed to participants of the UNFCCC meeting in Poznan, Poland. Other climate strategies have looked at the Montreal Protocol for ideas as well. For example, in Boiling Point, Ross Gelbspan suggests taking the Montreal protocol model as the blueprint for the post-Kyoto climate regime. In particular, he points at the role that the industry played to reduce CFC concentration in the

---

25. CAP & SHARE, supra note 22, at 6.
27. CAP & SHARE, supra note 22, at 7.
30. CAPANDDIVIDEND, supra note 29.
31. CAPANDDIVIDEND, supra note 29.
32. CAPANDDIVIDEND, supra note 29.
34. KYOTO2.ORG, supra note 33.
35. OLIVER TRICKEL, KYOTO2.ORG, HOW TO MANAGE THE GLOBAL GREENHOUSE (no date), available at http://www.kyoto2.org/docs/kyoto2_leaflet_complete.pdf.
36. TRICKEL, supra note 35.
It is a widely-shared point of view that the Montreal protocol happened largely because chemical companies who produced ozone-depleting chemicals had a technological solution to replace CFCs. Thus, in Gelbspan’s view, the way out of the climate gridlock is to turn to fossil fuel producers and oil companies and make them part of the decarbonization solution.

Although the reviewed proposals represent a measurable departure from the current climate regime in terms of substance, methodologically they are very similar. First, the reviewed proposals are based on the global problem/global solution approach that would require some kind of international consensus. Even if one of the proposed schemes becomes part of the new climate agreement, we will not see it come into force until 2020. Meanwhile, the decisions to develop Arctic oil fields are being made right now. Second, the proposals are built on the following types of government intervention: direct regulation, market-based mechanisms, or a combination of the two. Adoption of new regulations or market-based mechanisms (e.g., taxes) often becomes a politically charged issue domestically. Therefore, ratification of an international agreement that is based on these forms of governmental intervention may become a difficult hurdle to clear. Third, all three proposals require a new bureaucracy to implement and enforce the new rules. This will take time and financial resources that even some developed countries do not have.

The authors of the proposals argue that their models will work because they are simpler, more equitable, and more efficient than the current regime. These claims may all be true regarding the substantive qualities of the proposals. However, these qualities do not necessarily make the proposals politically feasible. It is likely that any attempt to restrict a country’s right to exploit its natural resources, as authors of Cap & Share fully acknowledge, will be met with significant resistance, especially from fossil fuel exporting countries. Because of this, the proposals would likely result in the same political gridlock they try to avoid.

38. Id. at 192.
40. GELBSPAN, supra note 37, at 192–93.
41. FOUND. FOR ECON. OF SUSTAINABILITY, supra note 22, at 3.
43. Cap & Share authors acknowledge this in the following passage: “The C&S proposal to share the scarcity rent fairly amongst the world’s entire population is likely to provoke a hostile reaction from the fossil fuel producing companies and countries. And, since oil production is becoming
II. DISCLOSURE: WHY THE FORM MATTERS.

Considering the strength of global climate gridlock, policymakers need to find a solution that is not only theoretically effective, but also politically feasible. Currently, political feasibility may be the most important feature of a climate change policy tool. As noted above, several theoretically sound models exist for mitigating climate change. Some researchers assert that no technological breakthrough is needed to prevent a climate change meltdown as carbon emissions can be halted with existing technology.44 Thus, finding the form of government intervention capable of overcoming the lack of political will is as important as the substance of the model. I thus propose using disclosure, or targeted transparency, as a methodology for designing a climate control mechanism that focuses on fossil fuel production.

A. Disclosure as a Policy Instrument.

As mentioned above, government intervention comes in the form of direct regulation (e.g., standards), market-based mechanisms (e.g., tax incentives, cap-and-trade schemes, etc.), and targeted transparency.45 Theoretically, direct regulation guarantees the highest certainty in reaching a regulatory goal.46 A firm has little choice but to comply with a specific target (standard) that the government sets because suspending operations or paying a significant penalty leaves no or very little room for alternative behavior.47 Market-based mechanisms, despite sending a clear regulatory signal, do not provide the same level of certainty that direct regulation does.48 For example, in a “classic” cap-and-trade scheme, a firm has a choice of whether to improve its technology and reduce emissions or to purchase more permits. Targeted transparency guarantees achieving the

46. See id. at 48 (explaining that direct regulation stipulates clear standards and leaves little room for industry discretion).
47. Id. at 47–48.
48. Id. at 48.
regulatory goal to an even lesser extent. Regulators usually have some idea of how people will respond to the disclosed information (e.g., people are likely to buy the stock of a more carbon-neutral oil company). However, the reactions or “the ability of disclosers to perceive those reactions” are not guaranteed because, at the end of the day, people may care more about money than the environment.

A legitimate question arises: why should we even bother with disclosure? To answer this question, I will turn to the benefits of targeted transparency vis-a-vis the direct regulation and market-based instruments. Archon Fung, Mary Graham, and David Weil, the authors of Full Disclosure: The Perils and Promise of Transparency, describe targeted transparency as follows:

Instead of aiming to generally improve public deliberation and official’s accountability, targeted transparency aims to reduce specific risks or performance problems through selective disclosure by corporations and other organizations. The ingeniousness of targeted transparency lies in its mobilization of individual choice, market forces, and participatory democracy through relatively light-handed government action.

Targeted transparency has a wider set of pathways to achieve a desired objective. Direct regulation and market-based mechanisms operate via economic pathways. For example, suspension of further operations or a high penalty assessed against a firm will likely result in economic loss to its owners. Similarly, a firm may choose to improve energy efficiency of its building because of the economic incentives in the form of a tax credit. In addition to economic pathways, targeted transparency employs political pathways. Political pathways are especially important in our case because they create political power to push the “regulatory envelope.” For example, information about the impact of emissions “exported” by oil companies

49. Id. at 48–49.
50. Id. at 48.
51. Id.
52. Id. at 5.
53. Id. at 47.
54. Id.
55. Id.
56. See id. at 47 (explaining that standard and market-based regulations are largely economic and that targeted transparency employs political pathways as well).
may prompt voters to advocate for extending the reach of a carbon cap to
the emissions that are yet to be released from fossil fuels.

The combination of public pressure and low degree of government
intervention make targeted transparency a politically feasible solution.
When Congress considered domestic climate legislation in 2007, Mary
Graham and Elena Fagotto, both from Harvard’s Transparency Policy
Project, noted that: “A transparency requirement could break the political
logjam that has held up climate change legislation in Congress.
Transparency often has broad appeal to both Democrats and Republicans
because it empowers ordinary citizens, strengthens market mechanisms, and
allows executives to choose what actions to take in response.”57 We will
never find out whether Ms. Graham and Ms. Fagotto were right, as
Congress never considered a climate change bill based on targeted
transparency. However, the attempt to adopt the largely market-based
Waxman-Markey policy failed as the composition of Congress changed
after the mid-term elections in 2010.58

Strong indicators exist as to why people will respond to the disclosed
climate related information. According to Gallup public opinion polls, more
than half the population in developed countries believes that global
warming is a serious threat.59 Figures from other polls indicate that the
number of concerned people is even higher.60 For example, according to a
Yale and George Mason University study conducted in 2009 and 2010, 61%
of Americans believe that global warming is real.61 More importantly, 65%
of Americans support signing a global treaty that would require the United
States to reduce its emissions by 90% by 2050.62 What is even more
couraging for this case study is the fact that 83% of Britons view climate

57. Elena Fagotto & Mary Graham, Full Disclosure: Using Transparency to Fight Climate
58. See H.R. 2454 (111th): American Clean Energy and Security Act of 2009, GOVTRACK.US,
http://www.govtrack.us/congress/bills/111/hr2454 (last visited Apr. 12, 2012) (providing an overview
of ACES major provisions and procedural history).
59. Anita Pugliese & Julie Ray, Fewer Americans, Europeans View Global Warming as a
Threat, GALLUP (Apr. 20, 2011), http://www.gallup.com/poll/147203/Fewer-Americans-Europeans-
View-Global-Warming-Threat.aspx. The focus is on the figures from developed countries because the
proposed disclosure is aimed at the investors from these countries.
60. Lee Dye, Op-Ed., Global Warming and the Pollsters: Who’s Right?, ABC NEWS (June 16,
61. Dye, supra note 60; In the Gallup poll, 53% of Americans indicated that global warming
represented “a serious threat to them and their families.” Pugliese & Ray, supra note 59.
62. Dye, supra note 60.
change as a “current and imminent threat.” A Guardian/ICM poll published in January 2011 showed little change in public opinion from August 2009. Remarkably, “Climategate” of 2009 and two uncharacteristically cold winters in 2009 and 2010 made no difference in how Britons feel about the most serious environmental problem of our times.

The climate marketing campaigns of oil majors offer further evidence of the connection between people’s thoughts on climate change and their behavioral responses. The “last bastion” of open opposition to climate change fell in 2007 when Exxon Mobil softened its stance on the issue. Now all oil majors recognize the threat of global climate change and even offer solutions to the problem. Regardless of whether the climate change material of these marketing campaigns reflects a real effort to combat climate change or the effort to please the customers, it ultimately underscores the fact that people care about the issue.

Despite a higher level of uncertainty as to its outcome, disclosure offers two great advantages: light government intervention and opportunity to create the much-needed political will. Both factors make disclosure a

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64. Carrington, supra note 63.

65. Carrington, supra note 63.


politically feasible form for designing a climate control mechanism that focuses on fossil fuel production. A switch from direct regulation to disclosure may shift the public rhetoric from “excessive regulation kills private companies” to “what are oil companies hiding” while keeping the target (e.g., oil production) constant. And this shift might be enough to prevent nations from making economically and environmentally unsound decisions.

B. Why the Existing Information Is Not Enough.

“We already know what oil companies do—they produce oil, what else is there to know?” This was a typical comment that a few people made in response to this study. The response exemplifies what is known in the literature as “imperfections of real-world information.”69 As it is unwise to judge a book by its cover, it is also unwise to judge the true contribution of an oil company to climate change by the mere fact that it is an oil company, or by what the company says in its advertising materials or even financial reports. The latter seldom include information about the emissions to which the company contributed by providing its customers with the “fuel to burn.” The emission information that the marketing materials and financial reports provide includes emissions from production, refining, and/or transportation operations. This information hardly reflects a company’s real impact on climate change, as the “total” emissions data may exceed the reported data by as much as fifteen times.70 Similarly, not all oil companies may be the same, as some are more serious than others about diversifying their business model and gradually reducing their oil output and, thus, “total” emissions. The currently available information about oil exploration and extraction is not sufficient to create a picture of the effect of these operations on climate change. The ensuing discussion highlights the deficiency of the real-world information and calls for the disclosure that sets mandatory reporting requirements for all actors in the sector.

Information conveyed in BP’s “Beyond Petroleum” advertising materials and the company’s financial reports serve as good examples of imperfect real-world information.71 “‘Beyond petroleum’ sums up our brand in the most succinct and focused way possible. It’s both what we stand for

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69. Fung et al., supra note 45, at 31.
70. See infra pp. 17–20.
and a practical description of what we do,” states BP on its website.\textsuperscript{72} BP defines the substance of its “Beyond Petroleum” corporate brand in the following three-prong explanation of its activities:

- exploring, developing and producing more fossil fuel resources to meet growing demand
- manufacturing, processing and delivering better, more advanced products
- enabling the material transition to a lower carbon future.\textsuperscript{73}

It appears that producing more fossil fuels serves as the focus of BP’s activities, and “better, more advanced products” to “satisfy growing demand,” thereby laying the foundation for transitioning to “a lower carbon future.”\textsuperscript{74} Although this statement defies the rules of logic (prongs one and three directly contradict each other), the statement contains key words appealing for environmentally conscious, as well as “traditional,” investors.

Perhaps the “devil” is in details. BP proudly notes a $5 billion investment (since 2005) in renewable energy, as well as its commitment to invest up to $8 billion by 2015.\textsuperscript{75} The section of BP’s site dedicated to alternative energy is impressive as well.\textsuperscript{76} It provides detailed information about BP’s clean energy programs, including biofuels, wind, solar, hydrogen power, and carbon capture and sequestration, as well as BP’s venture capital arm that finances “early and growth stage [cleantech] companies around the world.”\textsuperscript{77}

In its annual report, BP discloses its GHG emissions and risks to its operations due to the physical consequences of climate change.\textsuperscript{78} BP also

\textsuperscript{72. BP, supra note 71.}
\textsuperscript{73. BP, supra note 71.}
\textsuperscript{74. BP, supra note 71.}
\textsuperscript{75. Annual reporting 2011, BP, http://www.bp.com/sectionbodycopy.do?categoryId=9039423&contentId=7072266 (last visited Apr. 9, 2012).}
provides a thorough summary of existing and pending legislative and regulatory GHG controls and their potential effect on the company’s operations. BP recognizes potential drawbacks of carbon controls but reiterates its commitment to transitioning to a low-carbon economy in the following statement:

**Climate change and carbon pricing – climate change and carbon pricing policies could result in higher costs and reduction in future revenue and strategic growth opportunities.**

Compliance with changes in laws, regulations and obligations relating to climate change could result in substantial capital expenditure, taxes, reduced profitability from changes in operating costs, and revenue generation and strategic growth opportunities being impacted. Our commitment to the transition to a lower-carbon economy may create expectations for our activities, and the level of participation in alternative energies carries reputational, economic and technology risks.

BP creates the appearance of providing a comprehensive position on climate change. The company reports its direct GHG emissions, and describes its climate change policy and steps taken in its furtherance. As a result, BP has been regarded as a proactive, transparent, and responsible company in terms of climate change. According to public polls, consumers found BP the “greenest” oil company in 2006. The company’s sales increased from $192 billion to $266 billion between 2004 and 2006. There is no firm evidence suggesting that the increase in sales was strictly due to the campaign. However, given the fact that “Beyond Petroleum” was getting significant public attention during this time period, it is reasonable

79. BP ANNUAL REPORT 2010, supra note 78 at 78–81.
82. “Beyond Petroleum” Pays Off for BP, supra note 81.
to conclude that the campaign at least contributed to the company’s commercial success.

Unfortunately, the disclosed carbon emission information represents a small fraction of BP’s current contribution to climate change. BP estimated that in 2004, consumption (combustion) of its products resulted in 1,376 Mt in CO₂ equivalent. In the same year, BP’s direct and indirect emissions amounted to 91.6 Mt of CO₂ equivalent. Thus, BP’s “own” emissions constituted only 6.2% of the company’s “total” emissions.

Given the company’s strategy of selling mature assets and aggressively investing in new oil production to “meet growing demand,” BP’s total future emissions presumably will increase. Accordingly, the increase in emissions due to the increase in production may outweigh the gains from investment in green technologies in terms of the overall effect on climate change. Thus, the credibility and logic of the following BP statement appears to be questionable:

We will also continue to respond to climate change, and to the prospect of fossil fuels becoming a smaller part of the energy mix. For these reasons, BP must continue to be a leader in high-quality hydrocarbons today, while developing the intelligent options we will all rely on tomorrow. Lower-carbon resources remain central to this long-term strategy.

As BP’s example clearly shows, measuring a company’s “own” emissions does not provide a complete picture of a firm’s overall contribution to climate change. Theoretically, the “hidden” emissions could be accounted for at the point of consumption. However, because no universal global reporting requirement exists, a significant part of the “hidden” emissions remains hidden. Additionally, conventional emissions

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84. Sæverud & Skjærseth, supra note 81, at 42.
86. Id.
87. It is worthwhile to note that the company does not provide any quantified data about the offsetting effect of its commendable investments in green technologies on the “total” present and future emissions.
88. BP ANNUAL REPORT 2010, supra note 78, at 7.
reporting is done retrospectively and does not include potential future emissions.

As noted above, one could argue that we already know that oil companies produce oil along with petroleum products and measuring potential emissions from the extracted fossil fuels is not new information. This misconception perfectly demonstrates the imperfection of the real-world information phenomenon. For example, investors may know the company’s current daily output, but this information is unlikely to reflect the company’s dependence on maintaining or increasing its output in ten years. Because information is a public good (i.e., its consumption is not rival), many actors have real incentives to withhold it (fully or partially). This leads to information asymmetries that lead to two parties having uneven “information power” (i.e., adverse selection), with one party unable to validate the information given by the other (i.e., moral hazard).

As concluded above, investing in fossil fuel production without taking into consideration future emissions generated by the extracted minerals creates dangerous carbon lock-in. Despite the apparent link between an increase in production of fossil fuels and an increase in emissions, the consequences may seem too abstract and amorphous for investors, as well as corporate and government decision-makers, to account for when considering new production capacity. On the other hand, arguments in favor of oil exploration and extraction usually have a quantifiable component. For example, a projected decrease in Russia’s revenue as a result of not replacing depleting oil fields in Western Siberia with fields in the South Kara Sea can be presented in real numbers easily understood by general public. Similarly, the failure to close the stock swap deal cost BP’s balance sheet up to 114.36 billion barrels of oil equivalent (boe) of hydrocarbons, including 35.74 billion barrels of oil. A carefully crafted mandatory disclosure that sets forth requirements for reporting data

89. Fung et al., supra note 45, at 31.
90. Id.
91. Id.
92. See Elinor Ostrom, A Polycentric Approach for Coping with Climate Change 8 (The World Bank Dev. and Econ. Research Grp., Working Paper No. 5095, 2009), available at http://www.iadb.org/intal/intalcdi/PE/2009/04268.pdf (arguing that the problem with collective action is that the costs of contributing are concentrated and the benefits are diffuse). The same logic can apply to production of fossil fuels, yet in the reverse order. Based on investment records, oil exploration and extraction offers real economic benefits while abstaining from it offers uncertain (in terms of costs) consequences.
93. The “booking” South Kara Sea resources should not be underestimated. ExxonMobil announced that it would be able to do so (despite the fact that Rosneft holds the licenses) less than a month after signing the agreement with the Russian company. Humber & Bierman, supra note 16.
connecting investment and emissions can provide certainty for the field hindered by the biases, inaccuracies, and distortions of real-world information. Such disclosure can do for climate change analysis of investment in new oil production what estimated reserves do for economics analysis—offer quantifiable consequences of the action.

III. WHAT INFORMATION SHOULD BE DISCLOSED?

A. Total Emissions and Carbon Dependence of Investment (CDI).

Knowing what total emissions are is important for understanding the impact of oil production operations on climate change. However, while answering the question of what the total climate change impact was or can be, the total emissions analysis lacks an important feature. It does not show the connection between investment in fossil fuel production and climate change consequences of the production. As a result, the total emissions analysis is not a very effective tool for reconciling economic activities with climate change concerns. CDI, on the other hand, ties investment interests and their climate change consequences together and helps to determine the carbon emissions that a project will have without incurring economic loss.

The total emissions analysis can be done in many different ways: per company, project, geographic region, or even country. This analysis can be done prospectively or retrospectively. In the BP example above, I noted the British oil giant’s total emissions for 2004. A similar calculation can be done prospectively based on the projected company’s output and own emissions for the given year. The total potential emissions analysis for an oil field, geographic region, or country can be done using reserves or estimated resources data. The following example provides an illustration of the analysis. According to the USGS, Russia hosts 43 of 61 significant Arctic oil and gas fields, which translates into approximately 100 billion boe of undiscovered resources. 20% of it is believed to be oil. Combustion of one barrel of oil results in 0.43 tonnes of CO₂ equivalent on

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94. Although often used interchangeably, definitions of oil reserves and resources differ significantly. For a discussion regarding defining and measuring oil reserves and resources, see INT’L ENERGY AGENCY, supra note 11, at 114–15.
average. Production or Well-to-Tank (WTT) emissions usually comprise 18% of all emissions per barrel. Thus, it takes, on average, 22 barrels worth of GHG emissions (in CO₂ equivalent) to produce and deliver 100 barrels of crude-based fuel (Production Emissions Factor). Finally, the combustion factor for crude oil is 92–95%. This means that, on average, 9395% of all extracted crude oil is used as fuel. Thus, total emissions from Russian Arctic oil should be calculated as follows:

\[
\text{Total Emissions} = \text{Combustion Emissions} + \text{Production Emissions}
\]

where:

\[
\text{Combustion Emissions} = \text{Fossil Fuel Commodity} \times \text{Combustion Factor} \times \text{Carbon Intensity}
\]

and;

\[
\text{Production Emissions} = \text{Combustion Emissions} \times \text{Production Emissions Factor}
\]

If USGS is correct about the Russian Arctic resources, the total emissions could potentially reach 9.9–10 Gt.

The key word in the last sentence is “potentially,” as the total emissions analysis does not indicate the likelihood of these potential omissions.

98. Green Power Equivalency Calculator Methodologies, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/greenpower/pubs/calcmeth.htm#gasoline (last visited Apr. 9, 2012). This, of course, is an approximation as different kinds of crude oil have different carbon intensity.

99. The average is based on the three transportation fuels delivered for consumption to the U.S. NAT’L ENERGY TECH. LAB., CONSIDERATION OF CRUDE OIL SOURCE IN EVALUATING TRANSPORTATION FUEL GHG EMISSIONS 2 (2009), available at http://www.netl.doe.gov/energy-analyses/pubs/Life%20Cycle%20GHG%20Analysis%20of%20Diesel%20by%20Crude%20Oil%20Source%20.pdf [hereinafter NETL Report]. The “production” emissions include emissions from extraction, refining, and transportation. The report does not include emissions from exploration activities.

100. Id.


102. The methodology used for calculating total emissions is similar to the Life Cycle Analysis approach used in the NETL report. NETL Report, supra note 99, at 2–3.
occurring. Likewise, it does not provide any information regarding the strength of the carbon lock-in if the production operations have already started. In contrast, the CDI analysis targets carbon lock-in and its economic aspect in particular. CDI measures the amount of carbon (in CO₂ equivalent) that needs to be emitted over a period of time to avoid economic loss. In that sense, CDI provides a quantitative and temporal assessment of one’s financial dependence on activities that inevitably lead to carbon emissions. CDI is based on the following two elements.

First, CDI includes activities whose economic success is contingent, directly or indirectly, on combustion of fossil fuels. Oil exploration and extraction, the illustration for CDI application used in this study, is one example of such activities (the “CDI target activities”). Because over 92% of extracted crude oil is combusted to produce energy, the success of an investment in oil exploration and extraction effectively depends on the demand for combustion of the extracted oil, and thus, indirectly, on emission of greenhouse gases (GHGs). Another example of the CDI target activities is construction on an oil pipeline. The purpose of an oil pipeline is to transport crude oil. It usually cannot be used for anything else. Thus, the economic success of such an investment depends on how much oil is transported through the pipeline.⁹³ Similarly to the first example, an investor in an oil pipeline becomes a de facto cheerleader of steadily increasing GHG emissions.

Second, CDI employs targeted transparency. For the reasons stated above, disclosure is the most politically feasible form of “carbon” solution today. In addition, CDI gives people an opportunity to “vote” with their money according to their political and moral beliefs. It also gives them a comprehensive tool for assessing climate change risks associated with their investment.

Both total emissions and CDI analyses provide important information for understanding the cumulative impact of fossil fuel production on climate change. Both indicators can be used as a basis for designing a climate control mechanism. However, the carbon lock-in angle that CDI helps to reveal brings another dimension to the disclosure that the total emissions analysis fails to do.

⁹³ This explains the great support of Alyeska, the operator of the Trans Alaska Pipeline System for oil exploration in the U.S. Arctic. Arctic Oil and Gas Development, CTR. FOR STRATEGIC AND INT’L STUDIES (July 12, 2011) (downloaded using iTunes).
B. CDI in a Nutshell: Mechanics and Components.

CDI ties investment interests together with their climate change consequences in the following manner. First, it determines how much of a fossil fuel commodity needs to be subjected to a CDI target activity (e.g., barrels of crude sold in production activities, barrels of crude transported via an oil pipeline, etc.) for the firm to recoup its investment in the activity and avoid economic loss.\textsuperscript{104} Second, it determines the combustion emissions from the fossil fuel commodity by using the carbon intensity and combustion factor of the fossil fuel. Third, it calculates the emissions from producing the fossil fuel commodity. Fourth, it combines the combustion and production emissions to show how “dependent” the investment is on carbon emissions. Based on the above, the general formula for CDI is as follows:

\[
\text{CDI} = \frac{\text{Investment}}{\text{Price per Unit of Fossil Fuel}} \times \text{Combustion Factor} \times \text{Carbon Intensity} + \text{Production Emissions}
\]

I explain each element of the CDI formula below using the failed BP-Rosneft deal as an example. For the sake of keeping this illustration simple, consider the following hypothetical scenario. It is assumed that the BP-Rosneft deal had succeeded and the companies formed a joint venture (Karaoil) to develop three license blocs in the South Kara Sea—EPNA 1, 2, and 3.\textsuperscript{105} Based on the value and number of the exchanged shares,\textsuperscript{106} it is assumed that Rosneft and BP equally own Karaoil, with Rosneft holding at least 51% of voting rights.\textsuperscript{107}

\textsuperscript{104} As noted above, not all extracted crude is combusted. Therefore, for the purposes of this calculation, the term “fossil fuel commodity” provides a more accurate description of the extracted mineral.

\textsuperscript{105} Foley, supra note 17.


\textsuperscript{107} Pursuant to article 9 of the Federal Law of the Russian Federation “on Subsoil Resources,” the right to use offshore oil and gas deposits can only be given to a company that satisfies the following criteria: 1) it has been formed under the laws of the Russian Federation; 2) it has five or more years of oil and gas exploration and extraction experience in the Russian continental shelf; and 3) the Russian Federation controls more than 50% of the company’s voting stock. Thus, the British ownership of the license holder could not have exceeded 50%. Federal’nyi Zakon RF o Nedrah [Federal Law of the Russian Federation on Subsoil Resources], Vedomosti S”ezda Narodnykh Deputatov Rossiiskoj Federatsii I Verkhovnogo Soveta Rossiiskoi Federatsii [Bulletin of the Congress of People’s Deputies of
To complete the first step of the CDI formula, we need to determine the total investment (sunk cost) of the project and the price of the fossil fuel commodity, crude oil in this case. Karaoil, through its BP and Rosneft shareholders, made “finding and development” (F&D) investments to explore the oil fields.\textsuperscript{108} Because none of the discovered oil has been sold, the investment in exploration returned zero dollars in revenue to date. Certain assets will have salvage value; thus, the fixed cost should be discounted by the salvage value of some capital assets. Karaoil discovered oil and moved to the production phase. Once lifting and sales began, Karaoil, BP, and Rosneft’s shareholders started recouping their investment in the South Kara Sea project. To lift the hydrocarbons, Karaoil incurred operating costs, such as worker’s salaries, equipment maintenance, cost of energy, etc. (also known as the “lifting cost”).\textsuperscript{109} Additionally, Karaoil paid taxes, as well as interest on the funds it borrowed.\textsuperscript{110} In the end, Karaoil’s total investment in exploration and extraction of the oil deposits can be represented by the following formula:

\[
\text{Investment} = (\text{F&D Costs} - \text{Salvage Value}) + \text{Lifting Cost} + \text{Financing Cost} & \text{ Taxes}
\]

Determining the price of fossil fuel commodity (crude oil) is the next sub-step. It is assumed that Karaoil will sell all the extracted crude oil without refining and delivering it. Thus, Karaoil will use the revenues from sales of the extracted crude to recoup its investment in the project. Oil prices are extremely volatile and virtually impossible to predict.\textsuperscript{111} For example, the EIA’s scenarios vary from an increase of as much as $199.90 per barrel by 2035 (the High Price Scenario) to $51 per barrel (the Low Price Scenario).\textsuperscript{112} The Reference Scenario prices oil at $125 by 2035.\textsuperscript{113}

\textsuperscript{108} INT’L ENERGY AGENCY, supra note 11, at 139. It is important to note that 70% of activities in an oil or gas project are carried out by contractors and subcontractors. EMMA WILSON & JUDY KUSZIEWSKI, INT’L INST. FOR ENV’T AND DEV., SHARED VALUE, SHARED RESPONSIBILITY: A NEW APPROACH TO MANAGING CONTRACTING CHAINS IN THE OIL AND GAS SECTOR 8 (2011). Thus, in the hypothetical example given here, contractor and subcontractor payments will comprise a significant portion of the F&D and lifting cost.

\textsuperscript{109} INT’L ENERGY AGENCY, supra note 11, at 444.

\textsuperscript{110} Id.


\textsuperscript{112} Liquid Fuels, supra note 111. It is important to note that many sources assess Arctic resources at a “certain price.”
Access to supply appears to be the dominating factor of the EIA analysis. As mentioned above, the EIA “de-carbonization” analysis prices oil at $135, $113, and $90 per barrel by 2035 depending on, respectively, the Current Policies, New Policies, and 450 scenarios. Thus, the CDI analysis can be done based on the past (e.g., $100 per barrel as a mean crude oil price over the last x years) or forecasted data (increasing or decreasing with time). It can also be done based on a mean of different scenarios or as a range.

The first step of the CDI analysis is the only critically different calculation from the total emissions analysis. The second step of the CDI analysis essentially duplicates the combustion emission calculation performed in the previous sub-section. Here, the fossil fuel commodity is multiplied by the combustion factor to determine the amount of fossil fuel, and then converted into the fossil fuel into combustion emissions by using the carbon intensity. The combustion factor may vary depending on the type of crude oil, as chemical composition of crude oil varies from one geographic location to another. The combustion factor may also fluctuate based on the market demand for fuels versus other petroleum products.

To complete the third step of the CDI analysis, calculation of the emissions from producing the fossil fuel commodity, we need to determine the phase(s) of the production process for which the firm is responsible. If Karaoil sells the extracted oil from the production platform (where it is pumped into the purchasers’ tankers), the company will be responsible for emissions from extraction. If Karaoil conducts exploration activities, then it will also be responsible for its share of exploration emissions. An average,
baseline share of the production emissions (Production Emissions Factor) during the extraction process is 7.3%. This means that it takes, on average, nine barrels worth of GHG emissions (in CO₂ equivalent) to extract 100 barrels of crude oil. Thus, production emissions should be calculated pursuant to the following formula:

\[
\text{Production Emissions} = \text{Combustion CDI} \times \text{Production Emissions Factor}
\]

It is worth noting that extraction of some types of crude oil is a very energy and, thus, emission-intensive process. For example, emissions from extraction of Canada oil sands exceed the baseline crude oil extraction emissions by the factor of three. The fourth step of the CDI analysis represents a simple summation of the combustion and production emissions.

Revisiting some of the numbers referenced throughout this study illustrates how the general CDI formula can be applied. The initial BP-Rosneft investment in exploring three license blocs located in the South Kara Sea (license blocs EPNA 1, 2, and 3) is believed to be up to $2 billion. We do not, and likely will not, know what constituted this “initial investment” because the agreement between BP and Rosneft never materialized. For purposes of this exercise, the “initial” investment is treated as part of exploration costs or capital costs for the entire project. The average price of oil is assumed to be $97.34, the price on the New York Mercantile Exchange for July 2011. It is also assumed that Karaoil outsourced all of the exploration activities and is not responsible for any exploration emissions. Thus, with the carbon intensity of oil at 0.43 metric ton of CO₂ equivalent the combustion factor is 95%, CDI of the initial investment equals over 8.4 million tonnes of CO₂ equivalent. This figure represents almost a week’s worth of CO₂ emissions in the United Kingdom at the 2009 level.

119. NETL Report, supra note 99, at 5.
120. Id.
C. Temporal Aspect of CDI Analysis.

Should the government provide tax incentives for advanced oil recovery (AOR) or exploration of new oil fields? How strongly will an oil company lobby against new climate legislation? Should a lender consider adding other collateral in addition to the drilling rig it is about to finance? Would it be more prudent for a pension fund to invest in an oil company that favors mature assets or an oil company that aggressively pursues new production capacity? The temporal CDI analysis can help answer these vastly different questions. The temporal analysis determines carbon dependence of a project, activity, firm, or asset in a given year. In this sense, the temporal aspect of the CDI analysis opens the decision-making tool for a variety of applications. It can help reconcile the nation’s economic policy with its climate policy. It makes evaluating different actors in the political process possible. It can serve as a risk assessment tool for certain types of projects and activities. Finally, it allows for comparing of fossil fuel-centric projects that are at a different stage of their development.

To understand the difference between the “static” CDI analysis described in the previous sub-section and temporal CDI analysis, it is sufficient to look at the initial phase of an oil development project. Oil companies usually estimate the duration of oil exploration and extraction for each new oil field based on a number of economic, technological, and geological factors. Using the estimated project duration, it is possible to allocate the total CDI based on the projected investment and production in each year. Allocating CDI just on the basis of investment in each given year does not give a complete picture of financial “dependence” on carbon emissions. For example, if a firm spent $1 billion each year for five years in F&D costs, its CDI at the end of year five should not be calculated in the $1 billion investment made that year. Assuming that the field has not produced any oil and, thus, has not recovered any investment, CDI in year five should be calculated based on the $5 billion cumulative investment.

The temporal analysis becomes even more important for an undertaking of the South Kara Sea venture’s size and magnitude. To illustrate this point, consider the following hypothetical:124 Karaoil estimates $280 billion to be the total investment in the project to develop and lift 3.5 billion barrels of

124. This example is provided for illustrative purposes only. Although some assumptions are based on the real data, they should not be viewed as a forecast of any oil development project in the Russian Arctic.
recoverable oil.\textsuperscript{125} 35\% of this amount, or $98 billion, will be invested in the form of F&D cost with 65\% or $182 billion representing lifting cost, financing cost, and taxes. The extraction emissions will be at the baseline level of 7.3\% of the life cycle emissions and the combustion factor is estimated at 94.5\%.\textsuperscript{126} Karaoil anticipates that the total duration of the project will be 25 years—five years of exploration and development followed by 20 years of production. The project started on January 1, 2011 and will end on December 31, 2035. Karaoil will make the F&D investment during the first five years of the project in five equal amounts of $19.6 billion. The first four years of the production stage will see the highest expenditures. Investments will gradually decrease toward the end of the production phase. Oil production will peak in year nine. Oil prices from 2011 to 2035 are taken from the EIA’s Reference oil price scenario.\textsuperscript{127}

Based on the general CDI formula, the more Karaoil invests without producing, the higher its CDI will be. The increasing oil prices offset some of the CDI growth, but not nearly enough to curb its steady growth during the first nine years. Thus, because no oil was produced during the exploration phase, CDI accumulates, and at any year during this period can be calculated as follows:

\[
\sum_{n \text{ years}} \text{CDI} = \text{CDI (Cumulative)}_{n \text{ year}}
\]

However, once the project starts producing oil, Karaoil starts recouping some of its cost, thus decreasing the amount of total investment. Because of the decrease in the total investment, the total project CDI will start going down in proportion to the depletion rate.

\[
\text{Total CDI} \times \text{Depletion Factor}_{n \text{ years}} = \Delta \text{CDI (Depletion)}_{n \text{ year}}
\]

Thus, the CDI in a given year for combustion emissions can be calculated using this formula:

\textsuperscript{125} According to Rosneft, the field’s resources are estimated at 16 billion tons of oil equivalent (toe) (114.36 billion boe) with up to 5 billion tons of oil (35.74 billion barrels). Russian Arctic Seas, supra note 16; Bolshoi Petroleum, VEDOMOSTI (Jan. 17, 2011), http://www.oilru.com/news/227118/. For the purposes of this exercise, I “discounted” Rosneft’s projection of 35 billion barrels of oil by the factor of ten. I also assumed $80 per barrel cost of recovery of Arctic oil, which is 20\% lower than the projected cost referenced above.

\textsuperscript{126} Given the harsh operating conditions, the extraction emissions for the offshore project of this kind will likely be higher than the baseline.

\textsuperscript{127} Liquid Fuels, supra note 111.
Finally, we need to add production emissions CDI for the given year to calculate Net CDI in the given year:

\[
\text{Net CDI}_{n} = \text{CDI}_{n} (\text{Combustion}) + \text{CDI}_{n} (\text{Production})
\]

where:

\[
\text{CDI}_{n} (\text{Production}) = \text{CDI}_{n} (\text{Combustion}) \times \text{Production Emissions Factor}
\]

When the project is well into the production phase, its CDI drops significantly. It continues to drop until all the investment is recouped.

The following table and graph provide illustrations of the Net CDI dynamics:
<table>
<thead>
<tr>
<th>Year</th>
<th>Investment Year</th>
<th>Estimated Oil Price per Barrel</th>
<th>Estimated Production PerYear (msb)</th>
<th>Depreciation Percentage</th>
<th>Total Investment Per Year ($ billion)</th>
<th>Total Cumulative Investment ($ billion)</th>
<th>State CIDI Per Year (Mt CO₂- eq)</th>
<th>CIDI (Combustion) (Mt CO₂- eq)</th>
<th>CIDI (Deposition) (Mt CO₂- eq)</th>
<th>CIDI (Combustion) Per Year (Mt CO₂- eq)</th>
<th>CIDI (Deposition) Per Year (Mt CO₂- eq)</th>
<th>Net CIDI (Mt CO₂- eq)</th>
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Total Investment: $2261 Million

Project Duration: 25 Years

Total CIDI: 1,250 Gr
The temporal CDI analysis allows for appropriate adjustments in the degree of the financial carbon lock-in if certain conditions change. In the above example, based on many projections, Karaoil assumes that demand, as well as the price of oil, will grow. For purposes of illustration, it is assumed that climate negotiations will produce a new international agreement based on equal responsibilities. It is also assumed that, by the time the new agreement comes into force in 2020, the production cost of the South Kara Sea oil goes up by $10 per barrel due to various regulatory fees, taxes, and surcharges targeting carbon. This cost increase will require a higher investment every year, which, in turn, will require Karaoil to sell more oil. Thus, the project’s CDI will increase, making it more “locked-in in the oil production.” If one assumes that the IEA’s estimate of oil demand and price was correct, and 2018 will, in fact, be the peak oil year, then the
price of oil will start gradually going down, reaching $81 per barrel in 2035. The decrease in oil price will require Karaoil to sell more oil to recoup its investment in the project, exacerbating the effect of the cost increase. If carbon controls continue to drive the cost of oil up and shrink the market, then Karaoil’s decision made in 2011 to proceed with the development may not be economically sound in 2030, when oil sales do not generate enough revenue to recoup remaining investment.

The ability of the temporal CDI analysis to assess carbon dependence at virtually any point in time goes beyond project evaluation. The nation may not have to choose between participating in the new climate agreement and meeting its current energy needs by promoting a short-term AOR solution with potentially lower CDI. The oil company may turn out to be the leader in diversifying its business model and be in a position to break from the more “carbon dependent” pack. This fact could turn the firm into a potential ally in the push for new climate legislation. The bank may ask for additional collateral or a higher interest rate, considering the risk that a drilling rig may not be a productive asset in light of the reduced demand for oil. The pension fund may invest in the oil company, favoring mature assets because of the lower net CDI exposure.

D. CDI, Carbon Accounting, LCA, and Risk Assessment.

When first considering the idea for CDI, it seemed likely that someone was already measuring indirect financial dependence on carbon emissions. Upon reviewing carbon accounting, life cycle assessment (LCA), and climate change risk assessment (RA), however, it became apparent that, while having many similar features, CDI is distinct enough to warrant at least an introduction. CDI does not in any way, shape, or form replace the aforementioned mechanisms. Rather, it compliments them by providing a different dimension of assessing impacts on climate change while making important economic decisions.

What truly differentiates CDI from other “carbon assessment” tools is the nature of the relationship between an investment and future carbon emissions. In this relationship, an investor retains a choice even after the decision has been made. The choice is between, on one side, “sponsoring” the ensuing emissions and recouping costs or, on the other side, abandoning the activity in which the investment was made and, as a result, suffering financial loss. CDI should be applied prospectively unless one wishes to assess a past decision.

Unlike CDI, carbon accounting measures actual carbon emissions. For example, the Greenhouse Gas Protocol, one of the most well-known and
accepted carbon accounting systems, focuses on the following emission
types: “[d]irect GHG emissions are emissions from sources that are owned
or controlled by the reporting entity” and “[i]ndirect GHG emissions are
emissions that are a consequence of the activities of the reporting entity, but
occur at sources owned or controlled by another entity.” The primary goal
of carbon accounting is to provide accurate emissions data.

Standards” provides the following definition of LCA:

LCA is a tool for the analysis of the environmental burden
of products at all stages in their life cycle – from the
extraction of resources, through the production of
materials, product parts and the product itself, and the use
of the product to the management after it is discarded,
either by reuse, recycling or final disposal (in effect,
therefore, “from cradle to the grave”). The total system of
unit processes involved in the life cycle of a product is
called the “product system”.

Similarly to CDI, LCA looks at the prospective environmental impact
of a product and, in some respects, is more thorough and inclusive in
assessing such impacts. However, LCA does not establish a direct, one-
step dependence link between an investment and ensuing emissions.

Both CDI and RA serve as decision-making tools. Both depolarize the
climate change debate by shifting the focus of public discussion from the
“existence” of the problem to the “degree” of the problem. However, RA’s
scope is much wider, as “[i]t considers the likely human and financial costs
and benefits of investing in prevention, adaptation and contingency
planning responses.” CDI, on the other hand, provides much narrower
information about the risks of tying investment in the “carbon business as
usual world.”

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128. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-09-423T, CLIMATE CHANGE SCIENCE HIGH
QUALITY GREENHOUSE GAS EMISSIONS DATA ARE A CORNERSTONE OF PROGRAMS TO ADDRESS
CLIMATE CHANGE 10 (2009).
129. FAQ, GREENHOUSE GAS PROTOCOL, http://www.ghgprotocol.org/calculation-tools/faq (last
visited Apr. 9, 2012).
130. HANDBOOK ON LIFE CYCLE ASSESSMENT 5–6 (Jeroen B. Guinée et al. eds., 2002),
131. For an excellent example of LCA analysis, see NETL Report, supra note 99.
132. NICK MARBEY ET AL., THIRD GENERATION ENVIRONMENTALISM, INC, DEGREES OF RISK:
DEFINING A RISK MANAGEMENT FRAMEWORK FOR CLIMATE SECURITY 10 (2011), available at
IV. CDI DISCLOSURE: POSSIBLE APPLICATIONS AND POTENTIAL CHALLENGES.

CDI is a flexible and universal decision-making tool that can be used statically or temporally, alone or in combination with carbon accounting, LCA, and RA. The CDI appeal to both moral beliefs and economic interests expands its application even further. This subsection summarizes how CDI can apply based on users (policymakers, regulators, and investors), scale (asset, project, and firm), scope (national and international), and sectors (oil industry, coal-fired power generation, transportation, etc).

A. Possible Applications.

CDI can become a useful decision-making tool for a wide spectrum of users, including policymakers, regulators, and investors. The example illustrating the total emissions analysis considered the potential emissions from exploring the Russian Arctic. A similar analysis can be conducted using CDI. A combination of information about climate-related economic risks of oil development and climate change consequences of such a development may influence the decision about opening the region to oil exploration and extraction. For the same reasons, regulators may want to consider making CDI part of the permitting and licensing process. Environmental impact assessment, exploration, and production licenses could be issued based on the results of the CDI analysis.

Because investors and lenders constitute a prime audience for CDI disclosure, they will be discussed in greater detail. CDI will give shareholders sufficient information to intelligently “vote with their money.” Institutional investors and lenders will be able to assess regulatory climate-related risk of investing in fossil-fuel centric projects. CDI can be reported in the form of voluntary or mandatory disclosure. Such a disclosure can be made as a stand-alone document or so-called mainstream financial reports (financial statements and other financial reporting). Strong arguments exist for making CDI disclosure mandatory as part of mainstream financial disclosure.

133. CLIMATE DISCLOSURE STANDARDS BD., CLIMATE CHANGE REPORTING FRAMEWORK–EDITION 1.0 6 (2010). The CDSB exposure draft provides the following definition of a “mainstream financial report”: “[T]he annual reporting packages in which certain companies are required to deliver their audited financial results under the corporate, compliance or securities laws of the territory or territories in which they operate. Mainstream financial reports are normally publicly available. They provide information to existing and prospective investors and are distinct from material published on a voluntary basis, such as corporate social responsibility reports. The exact provisions under which companies are required to deliver mainstream reports differ internationally.”
reporting. First, many companies already report their GHG emissions on a voluntary basis.\textsuperscript{134} For example, all oil supermajors report their “own” carbon emissions.\textsuperscript{135} The work that the Carbon Disclosure Project has done to proliferate voluntary carbon emissions reporting throughout the globe is truly commendable.\textsuperscript{136} Thus, a step from voluntary to mandatory reporting should not be difficult for many firms. Second, some countries, the United States, for example, already require some form of carbon disclosure.\textsuperscript{137}

And some countries that are in the process of forming carbon emissions disclosure rules are leaning toward mandatory disclosures.\textsuperscript{138} Aldersgate Group’s response to DEFRA’s “Measuring and reporting of greenhouse gas emissions by U.K. companies: a consultation on options” succinctly summarizes the benefits of mandatory reporting:

A clear, consistent, comparable definition of carbon disclosure is vital for progress towards U.K. climate change targets. Now that voluntary GHG reporting guidance has been published, it should be made mandatory for all large U.K. companies to ensure greater accountability and transparency. The administrative costs would be minimal for those who report anyway and help those who don’t to identify significant cost savings and address more effectively material climate risks and opportunities. It would also create a level playing field, allowing investors, consumers and the media to make meaningful comparisons, thus driving further emission reductions.\textsuperscript{139}


\textsuperscript{135} E.g., BP ANNUAL REPORT 2010, supra note 78, at 12.

\textsuperscript{136} CARBON DISCLOSURE PROJECT, supra note 134.


\textsuperscript{139} ALDERSGATE GRP., GOVERNMENT CONSULTATION ON MEASURING AND REPORTING OF GHG EMISSIONS 2–3 (2011), available at
Whether it is a drilling rig, license blocks EPNA 1, 2, and 3, or an oil major, CDI can be applied on different scales. One of the aforementioned examples mentioned that a drilling rig may not be safe collateral for a lender in a financing transaction. A rig’s monetary value may diminish with its value as a productive asset if oil demand goes down due to adoption of carbon controls. Additionally, a shrewd firm may choose to retrofit a “carbon-contingent” asset instead of replacing it with a new one based on a CDI analysis that shows a higher carbon dependence. Although a project’s CDI analysis has been covered at great length, one additional point must be emphasized. The CDI analysis of a project will not be effective if it is conducted without any frame of reference. Thus, it is important to use comparable data; one project can be compared against another, as well as against national emissions.

A point of reference becomes even more important when equity investors need to decide whether to invest into a particular company. The following features will strengthen CDI’s educational effect. First, the comparable data should tell how the companies stack up against each other. This can be accomplished by showing CDI per dollar invested by the company. Second, investors should know what CDI data means in terms of national emissions and a country’s commitment to reduce its own carbon footprint.140 Third, if possible, CDI should be “personalized,” i.e., allocated according to the interest that each shareholder owns in the company.141 Thus, a disclosure showing a total CDI per shareholder over a given period of time compared to other firms in the same sector, as well as the national emissions (both current and the ones that the country vowed not to exceed in the future) should provide effective comparative information.

Calculating CDI for an entire company will likely involve compiling CDI information from many projects, activities, and groups of assets. As tedious and complex as this task may seem, the potential benefits of collecting and processing the necessary data will outweigh the cost, especially if the firm intends to practice what it preaches. CDI disclosure may help the company back up its environmental claim with quantified

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140. For example, the information that BP “helped” create as much GHG emissions as the country of Germany in 2004 does not sit well with BP’s image as a “green” oil company. Sæverud & Skjærseth, supra note 81, at 42.

141. Allocating CDI per shareholder, rather than per share, accomplishes the goal of creating a “personal carbon burden.” Additionally, the amount of CDI per shareholder should not change if the value of a company’s share changes. “Personalizing” CDI may prove to be a challenge as large corporations can have many types of shares, giving their holders different rights.
evidence. However, CDI disclosure can also deal a quantified blow to a firm’s climate change public relations campaign. For example, BP’s decision to sell off its mature assets appears to be contradicting its “Beyond Petroleum” strategy. As the above graph suggests, investing in new oil production does the opposite of “enabling the material transition to a lower carbon future.”142

Although CDI is more likely to find its application as a national disclosure, it can also be incorporated into the international climate regime. CDI can be developed within the framework of mandatory climate change disclosures that some countries have already adopted.143 This, however, does not mean that countries should not coordinate their disclosure requirements. In fact, national CDI disclosure laws and regulations can only benefit from international guidelines and coordination.

On the international level, CDI can be used to measure a country’s ability to develop or transition to a low-carbon economy. Additionally, including CDI disclosure as part of national notifications under the UNFCCC will aid developed nations in demonstrating that they are truly following their commitments to mitigating climate change, i.e., reducing emissions at home while not financing them abroad.

Because CDI targets activities whose economic success is directly or indirectly contingent upon combustion of fossil fuels, CDI application is not limited to oil production or the oil and gas sector. CDI analysis can be applied to mining of fossil fuels at large, electric power generation (especially coal and natural gas), transportation, and essentially to any activity that will “live or die” based on whether fossil fuels continue to be combusted.

B. Potential Challenges.

It is a daunting task to come up with a detailed list of challenges to a concept that has only been introduced. However, even this introductory discussion of CDI evokes several considerations as to why the concept may or may not succeed.

As useful as the concept of CDI may appear, developing CDI into a functioning tool beyond this introduction may run into serious practical problems. Calculating CDI may prove to be too complex and costly. Firms may fight disclosure of certain information for confidentiality reasons. Due to a large number of assumptions and uncertainties, CDI data may simply

142. Beyond Petroleum, supra note 71.
143. See generally Ewing, supra note 137 (outlining the U.S. system of corporate disclosures).
be too speculative on which to rely. Finally, voters’ concern over climate change may not translate into shareholders deciding to abandon new oil production development. Thus, further studies are necessary to determine if CDI can join carbon accounting, LCA, and RA as a valuable “climate change” tool.

Yet, virtually all models rely on assumptions and have to grapple with uncertainty. Despite missing big in some forecasts, analysts keep giving investors a glimpse of what the world would be like in the short-, medium-, and long-term future. More importantly, investors continue to rely on these forecasts and make decisions based on them. After all, analysts are often right. A great deal of the data needed for calculating CDI is already reported by companies or is otherwise available. Annual reports give a great deal of information about the types and value of assets, including oil reserves. Additionally, some assumption deficiencies, such as the price of oil, can be avoided by using a data range.

Additionally, CDI does not rely solely on the moral aspect of people’s concern about climate change. It shows how much and for how long a firm is invested in the carbon status quo. An oil company with a “high” and “long” CDI may face a shrinking demand for its products if carbon prices make the alternatives more economically appealing. A careful investor mindful of a company’s CDI will think twice before “sinking” money into a potentially losing enterprise. In this sense, CDI assists investors in quantifying the risk of investing in a company whose performance is contingent (directly or indirectly) on high carbon emissions.

CDI’s success will also depend on the design, implementation, and enforcement of the disclosure. As many examples indicate, a disclosure can be rendered effective or useless depending on what information is disclosed and how the user perceives this information.\footnote{See FUNG ET AL., supra note 45, at 92–105 (summarizing the effectiveness of eight selected transparency policies).} Some disclosures, such as the Toxic Release Inventory (TRI), worked before the information ever reached the user. For example, executives of several large companies made a commitment to reduce toxic waste pollution by 90% before the first TRI reports were released.\footnote{Id. at 85.}

Correspondingly, CDI may also play an effective role in investor-targeted disclosures. Countries that are committed to transitioning to an economy with a low carbon net effect can use a CDI analysis to shape their public policy. For example, the government may design tax incentives
favoring advanced recovery from mature oil fields instead of developing new oil production capacity. National CDI analysis may be especially important for countries like Russia with economies that depend heavily on fossil fuel production.

While CDI may not be a “silver bullet” in solving the climate change problem, it may provide enough information to force decision-makers to think twice before launching projects that would be potentially disastrous for the global climate change mitigation effort. Correspondingly, a quantified picture of the carbon lock-in may convince debt or equity investors to choose more carbon-friendly investments. Regardless of the grounds for motivation, reconciliation of climate and fossil fuel production policies is needed to prevent economic loss at the expense of the environment, or environmental degradation at the expense of the economy. Thus, CDI analysis should be given proper consideration before the carbon hungry world goes full-steam ahead with the Arctic oil expedition.

CONCLUSION

Two starkly opposite points of view dominate the debate about transitioning to a low carbon economy. On one end of the spectrum is the smiling oil company executive who talks about jobs, energy security, and, occasionally, his company’s attempts to move toward cleaner fuels. On the other hand, authors like Paul Roberts, James Howard Kunstler, and Raymond J. Learsy warn readers about the grave dangers of our addiction to fossil fuels, oil in particular. Yet little research has been done to quantitatively link the investments that we are making now to achieve the goal of a low-carbon economy in the future. Pundits on the pro-fossil-fuel end of the spectrum cite economic reasons for continuing the status


149. *Bridging the Climate Divide, supra* note 146.
The proponents on the other end employ environmental reasons for ending the world’s dependency on fossil fuels. The reluctance of each group to compromise is easy to understand. The first group fears that phasing out fossil fuels will effectively mean the end of its existence, and the second group often operates under the assumption that because a low carbon economy means the end of the first group, the sides have nothing to talk about. As a result, the stalemate alienates the majority of people who are caught in the crossfire.  

As the two camps continue to argue, fossil fuel production and climate change policies go in separate directions, and GHG emissions continue to increase with the growth in supply of coal, oil, and natural gas. The failure of the current climate regime to provide a universal clamp on this growth has prompted governments and non-state actors to plan for ever-increasing fossil fuel production capacity. Every step in this direction perpetuates the carbon lock-in and puts a new climate “shared responsibilities” agreement in jeopardy. If the BP-Rosneft deal had gone through, then oil development in the South Kara Sea likely would have contributed to the existing carbon lock-in by adding a tight and strong dependence sub-system.

CDI can compensate for the lack of universal emission controls by targeting fossil fuel production. Because CDI helps to quantify the carbon dependence of investment decisions made by many people in the “middle,” it will help shift the climate debate to the center and, hopefully, amass greater political will to achieve meaningful emission reductions. The temporal aspect of the CDI analysis makes it even more flexible and open to many applications. Ultimately, CDI may or may not succeed. However, the potential benefits of the CDI analysis warrant, at least, further and more in-depth inquiry. Because the principal purpose of this study was to introduce the concept of CDI, the focus must now shift to fitting it for a specific application, and this is where the real work begins.

150. Id.
RIDGELINES AND THE NATIONAL SECURITY IMPLICATIONS OF COMMERCIAL WIND ENERGY DEVELOPMENT IN VERMONT

* Jody M. Prescott*

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* Senior Fellow, West Point Center for the Rule of Law, Colonel, U.S. Army (retired). The views expressed in this article represent the views of neither the Center nor the U.S. Military Academy.
In a groundbreaking article published in April 2011, two senior military officers working for the Joint Chiefs of Staff proposed a new strategic concept to guide the United States in its international engagement through a reprioritization of its domestic objectives. Recognizing the complexities of the current international security situation, the National Strategic Narrative suggested treating international security as a strategic ecology, in which the U.S. would need to influence events rather than try to control them, and where notions of dominance must give way to the practice of sustainability. In this context, the authors argued that the U.S.’ priorities should be promoting the development of its youth through a “sustainable infrastructure of education, health, and social services,” achieving a sustainable security posture that includes the conservation of resources, and the development of a plan for sustainable access to, cultivation, and use of the natural resources” required “for our continued . . . economic growth.” This would allow the U.S. to continue to exert credible influence in world affairs, while serving as an example of stability and sustainability in an interdependent strategic ecosystem rather than an unsustainable, dominant force.

The Obama Administration’s emphasis on developing renewable, clean energy sources, such as solar and wind power, would promote several complementary national energy security goals. First, reducing the U.S.’ reliance on foreign oil from politically unstable sources should decrease the likelihood that the U.S. economy will be held hostage by the policies of foreign petroleum producers, or even by terrorist attacks on overseas petroleum industry infrastructure or shipping lanes. Second, greater use of renewable energy sources could lead to an increase in modern manufacturing capabilities and jobs in this area, which could help rebuild some of the economic base lost during the financial crisis that began in

2. Id. at 8, 9, 11.
3. Id. at 8, 13.
4. Id. at 11.
2008. Third, increased use of domestic renewable energy sources should help mitigate the climate impact of fossil fuel-based carbon. Finally, renewable energy sources do not pose the same sort of environmental, social, and economic problems that accompany the use of traditional, non-renewable energy resources, particularly fissile.

Wind power, along with other renewable energy sources, supplies an ever-increasing percentage of the world’s energy needs. The availability of wind power also makes it an attractive energy source for countries concerned about both their dependence on foreign sources of fossil fuels and reducing their carbon emissions from the generation of electricity. Further, wind power uses almost no water, in contrast to energy generated from coal, natural gas, and fissile energy. In addition, the price of wind is free, which means that fuel costs are not variable, so energy production costs over the expected lifetime of a wind turbine system can be calculated very accurately. China has made great strides in bringing new wind power facilities on line, and it now has the largest amount of installed capacity in the world, but whether its power grid can efficiently handle all of the electricity generated is unclear. The European Union has embarked on an

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8. Id.
11. Id.
13. “Electricity generation accounts for nearly 50% of all water withdrawals in the nation, with irrigation withdrawals coming in second at 34%,” and even though most is recycled, “approximately 1.6 to 1.7 trillion gallons [are] consumed for power generation each year.” DEPT OF ENERGY, 20% WIND ENERGY BY 2030: INCREASING WIND ENERGY’S CONTRIBUTION TO U.S. ELECTRICITY SUPPLY 16 (2008), available at http://www.nrel.gov/docs/fy08osti/41869.pdf.
ambitious plan for its members to provide half of their electricity needs through wind power by 2050.\textsuperscript{16} Portugal, for example, began moving its electric generation towards renewable sources in 2005.\textsuperscript{17} Today, over 15\% of its electricity comes from wind power.\textsuperscript{18} The economic impacts of wind energy development ripple beyond its increasing share of the energy market. Evolving technologies are producing ever more efficient wind turbine systems.\textsuperscript{19} The manufacture of these new wind turbine systems promises to provide long-term employment for skilled workers across the global economy.\textsuperscript{20} For example, international firms in the U.S., such as Siemens\textsuperscript{21} and Vestas,\textsuperscript{22} have achieved a strong market presence in the domestic commercial wind turbine industry.\textsuperscript{23} Complementing the


international nature of wind turbine manufacturing, many international energy companies have either invested in, or are seeking to develop, wind power projects in the U.S. 24 Although wind is not a complete answer to the growing human population’s energy needs, the tremendous amount of investment in wind power systems across the world strongly suggests that it will be part of the solution. 25

As a national leader in the promotion of legal measures that protect the environment and energy efficiency, Vermont is a credible example of sustainability in line with the goals of the National Strategic Narrative. 26 For example, Vermont’s Act 250, which was promulgated to avoid undue adverse environmental impacts associated with major subdivisions and developments, was among the first laws of its kind in the nation. 27 The well-developed body of law concerning Act 250 from Vermont’s district commissions, Environmental Court, and Supreme Court significantly informs the process by which decisions in Vermont are made on the siting, construction, and operation of energy generating facilities pursuant to title ten, section 248 of the Vermont Statutes, better known as the section 248 process. These legal protections are complemented by a social, cultural, and political reputation for fostering environmental stewardship and conservation. 28 Surprisingly, however, despite being the site of the first


25. Some estimates suggest that depending upon increases in demand for electricity, wind energy could provide perhaps as much as 11% of the world’s electricity needs by 2020, and perhaps 20% by 2030. Wind Energy, supra note 14, at 28.


wind turbine in the U.S.,\textsuperscript{29} the first commercial wind power facility in the Eastern U.S.,\textsuperscript{30} and one of only two states without a coal burning energy plant,\textsuperscript{31} commercial wind power development in Vermont has lagged behind other states. Vermont has only two operating commercial wind power facilities at the time of this writing, which are capable of generating only 46 megawatts.\textsuperscript{32} The Vermont Public Service Board’s (PSB) recent approvals of additional wind power generating facilities possibly suggest that this trend is changing, but there is very strong opposition to the use of commercial wind power in many parts of the state.\textsuperscript{33} Given Vermont’s apparently warm embrace of environmental stewardship in general, why has a green energy resource, such as wind power, met such a chilly reception in the Green Mountains? The answer, in a word, is “ridgelines”—and the competing environmental concerns that flow from building wind power stations on them.\textsuperscript{34}
Wind resource mapping of Vermont has shown that the highest grade wind resources are associated with elevation; specifically, the ridgelines of the different ranges that compose the Green Mountains, which are generally over 2,500 feet in elevation, and which run north to south along the length of the state. However, these ridgelines have tremendous aesthetic appeal, both for nearby residents and for the economically important tourism industry. Ridgelines also have pronounced environmental significance because of the uncommon natural communities found at those altitudes and the potential effects of natural community fragmentation resulting from building wind power stations along the length of the ridgeline. Although Vermont’s particular circumstances may not necessarily be found in other states, it is not alone in having to resolve contentious siting issues regarding wind power stations. At least 30 states have some degree of environmental consideration embedded in their siting decision processes. Similarly, the use of federal property for wind power, whether on or off-shore, triggers requirements under the National Environmental Policy Act to assess criteria.
similar to those reviewed under section 248, although the two processes differ markedly in the effects of their respective assessments.

This article argues that Vermont’s holistic approach\(^\text{40}\) should be seen as a practical way forward in providing a credible example of reconciling valid competing sustainability interests consistent with the broad scope of the National Strategic Narrative. First, this article will briefly describe the structure and policies of the Vermont state and local governments as they are relevant to wind power docket before the PSB. Second, this article will describe the role and processes of the PSB in handling petitions for certificates of public good from wind power developers. The third part of this article will examine PSB decisions in more recent wind power docket\(^\text{41}\) to flesh out the jurisprudence of this quasi-judicial body regarding commercial wind power projects, especially with regard to the most controversial issues. These issues include public health; economic and societal benefits; the environmental factors of aesthetics, wildlife and wildlife habitat; and the role of public support for wind power projects. The fourth part of this article will take a case study approach to examine how the most recent wind power docket, the proposed Lowell Mountain project, played out against the precedential background of prior wind power docket, and will evaluate how the developer met the legal requirements necessary for the PSB to issue a certificate of public good. In conclusion, this article will show how the Lowell Mountain docket could serve as a potential example of best practices in pursuing wind power development—not just in Vermont, but in other states as well, especially those with strong environmental ethics and laws. This article will also show how the Lowell Mountain docket could potentially work in the federal domain, as communities, industry, and interest groups grapple with the issues of achieving sustainability in the face of competing positive environmental values.\(^\text{42}\)


42. See Joint Statement in Support of Wind Power Development in Vermont, press release from the Conservation Law Foundation, the Vermont League of Conservation Voters, the Vermont Natural Resources Council, and the Vermont Public Interest Group, Oct. 20, 2010,
I. STATE AGENCIES AND POLICY

A. The Agencies

The PSB is composed of a chairperson and two members.\(^{43}\) Although none of the members are required to be practicing Vermont lawyers,\(^{44}\) the chairperson is "nominated, appointed and confirmed in the manner of a superior court judge."\(^{45}\) The PSB members serve six-year terms,\(^{46}\) and two members are sufficient to constitute a quorum. The PSB conducts quasi-judicial hearings on energy utility issues, and its authority is extensive.\(^{47}\) PSB decisions are given the same effect as court decisions,\(^{48}\) and may be appealed to the Vermont Supreme Court.\(^{49}\) The Vermont Supreme Court gives "'great deference' to the [PSB’s] expertise and judgment, and 'accord[s] a strong presumption of validity to the [PSB’s] orders.'"\(^{50}\)

The PSB wields significant regulatory power over the operations of public utilities in Vermont. In doing so, its purpose is to promote a rational and efficient public utility system from a statewide perspective, rather than letting purely local interests predominate.\(^{51}\) It controls the movement of energy into and out of Vermont markets; the services that utilities may offer; the investments in, and construction of, large energy generation plants and transmission facilities; the degree to which utilities can incur long-term indebtedness or issue securities; and, perhaps most importantly, the

\(^{43}\) VT. STAT. ANN. tit. 30, § 3(a) (2010).
\(^{44}\) Id.
\(^{45}\) Id. § 3(b).
\(^{46}\) Id. § 3(d).
\(^{48}\) VT. STAT. ANN. tit. 30, § 9 (2010).
\(^{49}\) Id. § 12.
\(^{50}\) In re Amended Petition of UPC Vermont Wind, LLC for a Certificate of Public Good, Pursuant to VT. STAT. ANN. tit. 30, § 248, et al. (Ridge Protectors, Inc., Appellant), 2009 VT 19, ¶ 2, 185 Vt. 296, 299, 969 A.2d 144, 147 [hereinafter UPC Vermont Wind]. Appellants must show clear error to prevail. Id.
\(^{51}\) In re Petition of Tom Halnon, 174 Vt. 514, 518, 811 A.2d 161, 166 (2002).
conditions under which utilities provide services to their customers, including pricing.\textsuperscript{52} In following the section 248 process, however, the PSB is not bound by Act 250 jurisprudence, nor is its environmental impact inquiry limited to the Act 250 evaluation factors.\textsuperscript{53} In making this determination, the PSB takes a holistic approach in balancing the potential adverse impacts, environmental and otherwise, against the greater good that would accrue to Vermont and its citizens.\textsuperscript{54} Accordingly, unlike the District Commissions that apply Act 250 to proposed developments—which will not grant permits if the environmental impact is undue or unreasonable—\textsuperscript{55} the PSB may determine that the public good is met by an energy development project that may have adverse environmental impact. Further, even if the development of certain land was previously considered under the Act 250 process, a later proposal to build an energy generation project on that same land is only evaluated by the PSB under the section 248 process.\textsuperscript{56}

In hearings before the PSB on petitions for certificates of public good for new energy generation facilities and transmission lines, both the Agency of Natural Resources (ANR) and the Department of Public Service (DPS) are automatically included as interested parties and provide testimony on proposed projects. The ANR has three departments, each of which plays a role in the section 248 process, either directly or indirectly: Environmental Conservation; Forest, Parks and Recreation; and Fish and Wildlife.\textsuperscript{57} The Environmental Conservation Department is responsible for reviewing applications for various permits, such as for storm water runoff.\textsuperscript{58} The Forest, Parks and Recreation Department manages state-owned lands under ANR jurisdiction, which include publically-owned mountains and

\textsuperscript{52} STATE GOVERNMENT, supra note 45, at 554.

\textsuperscript{53} Georgia Mountain, supra note 39, at 28.

\textsuperscript{54} The Vermont Supreme Court has characterized the PSB’s evaluation of a petition for a Certificate of Public Good as a “legislative, policy-making process.” UPC Vermont Wind, 2009 VT 19, ¶ 2, 185 Vt. at 299, 969 A.2d at 147 (quoting In re Vt. Elec. Power Co., 2006 VT 69, ¶ 6, 179 Vt. 370, 376, 895 A.2d 226, 230).

\textsuperscript{55} See generally In re McShinsky, 153 Vt. 586, 572 A.2d 916 (1990) (affirming PSB’s denial of permit because of its undue adverse environmental impact); ARGENTINE, supra note 27, at 5–7, 57–211.


\textsuperscript{57} STATE GOVERNMENT, supra note 45, at 490–508.

\textsuperscript{58} Id. at 493–94.
ridgelines. The Fish and Wildlife Department is responsible for wildlife and wildlife habitat conservation and providing fish- and wildlife-based recreation opportunities to the public. The main purpose of DPS is to obtain for Vermont consumers “proper utility service at a minimum cost under efficient and economical management consistent with other public policy of the state.” As the public’s advocate, DPS addresses, among other issues, cost and power grid reliability in its testimony before the PSB.

Electricity generating plants and transmission facilities can begin neither site preparation nor construction in Vermont until the PSB has issued a certificate of public good. The PSB assesses each petition for a certificate of public good under ten broad criteria, nine of which are potentially applicable to wind power projects. First, the proposed project may not “unduly interfere with the orderly development of a region.” Second, the capacity generated by the project must be necessary to meet future demand, for which conservation measures would not be a cost-effective means for making up the shortfall. Third, the project must not

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61. VT. STAT. ANN. tit. 30, § 202(a) (2008). Vermont’s general energy policy is “to assure, to the greatest extent practicable, that Vermont can meet its energy service needs in a manner that is adequate, reliable, secure and sustainable; that assures affordability and encourages the state’s economic vitality, the efficient use of energy resources and cost effective demand side management; and that is environmentally sound.” Id. § 202a(1).


64. Id. § 248(b)(1). Although affirmative municipality votes are not required for certification unless the proposed project is a municipal or cooperative endeavor, Id. § 248(c), “due consideration [is] given to the recommendations of municipal and regional planning commissions . . . legislative bodies, and the land conservation measures contained in the plan of any affected municipality.” Id. § 248(b)(1).

Importantly, federal environmental law may also require obtaining federal permits before any construction is authorized. See, e.g., Letter from Reg. Div., New England Dist. Corps. of Eng’ts., to Mr. David Cowan, V. P. of Envtl. Aff., UPC Wind Mgmt., LLC (July 18, 2008), http://docs.wind-watch.org/ridge-protectors-motion-29jan2009.pdf (providing notification in Attachment 3, intervener’s motion to require developer to file an amended application for certificate of public good, that the developer’s plan to impact a 0.23 acre area of wetlands and waterways in conjunction with the Sheffield wind farm was authorized and granted a federal permit).

65. Id.

66. Section 248(b)(2). This requirement is waived if “the facility is a SPEED resource and if no part of the facility is financed directly or indirectly, other than power contracts, backed by Vermont electricity ratepayers.” Id. § 8005(b)(9).
adversely affect the power grid’s stability and reliability. Fourth, the project must provide “an economic benefit to the state and its residents.” Fifth, it must not have “undue adverse effect[s] on esthetics, historic sites, air and water purity, the natural environment and public health and safety.” Sixth, the “purchases, investments, or construction by a company” must be consistent with the resource selection principles set out in the company’s approved least-cost integrated plan. Seventh, the project must comply with the DPS’ approved electric energy plan, or demonstrate that other good cause exists “to permit the proposed action.” Eighth, it must not affect or be located on any part of state waters that have “been designated as outstanding resource waters by the water resource board.” Finally, the developer must show that the project “can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers.”

B. State Renewable Energy Policy

Vermont has set goals to support the development of renewable energy through providing incentives for “retail energy providers to enter into affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuation.” “Renewable energy” is that energy produced from “a resource that is being consumed at a harvest rate at or below its natural regeneration rate.” Vermont has set up the Sustainably Priced Energy Enterprise Development (SPEED) program to help achieve its energy policy goals. Under SPEED, energy projects are divided into two categories: “qualifying” and “non-qualifying” resources. “Qualifying” resources are those that produce renewable energy that became operational after December 31, 2004, and include additional energy generated by retrofitted or improved renewable energy plants.
or “new renewable energy” resources are defined as renewable energy provided by a resource that became operational after December 31, 2004, or energy generated by retrofitted or improved renewable energy plants.\footnote{78} “Non-qualifying” resources are contracts for in-state resources that are fossil-fuel based combined heat and power facilities (CHPs).\footnote{79} Vermont’s long-range goal is to have SPEED resources, both qualifying and non-qualifying, provide twenty percent of electric retail sales in the state by July 1, 2017.\footnote{80} Further, Vermont has set a goal that by 2028, a minimum of sixty megawatts of power “[will be] generated within the state by combined heat and power (CHP) facilities powered by renewable fuels or by non-qualifying SPEED resources.”\footnote{81} However, by January 1, 2013, mandatory renewable energy portfolios will come into effect unless the goals for renewable electricity generation from qualifying resources have been met.\footnote{82} Because of reduced energy use in Vermont since 2005 and sufficient SPEED resources becoming operational, the PSB anticipates that a mandatory Renewable Portfolio Standard (RPS) will not need to become effective in 2012.\footnote{83} In its 2011 CEP, however, the DPS set out a long-term goal of meeting 90% of the state’s energy needs through renewable resources by 2050.\footnote{84} The CEP also recommended “that the legislature consider adopting a streamlined RPS for Vermont, with an aggressive total renewable electricity goal.”\footnote{85}

\footnote{78} Id. § 8002(4). These projects include “Cow Power™” facilities, “which digest cow manure to produce methane gas and use the methane gas to fire 200-600kW generators.” 2010 VT. PUB. SERV. BD. BIENNIAL REPORT 10 [hereinafter Biennial Report], available at http://psb.vermont.gov/sites/psb/files/publications/Reports%20to%20legislature/SPEED_biennial_report_2009_and_appendix.pdf. The electricity is then purchased by participating customers for an additional four cents per kilowatt hour. Id. at 41.


\footnote{80} Id. § 8005(d)(2).

\footnote{81} Id. § 8002(2)(6).

\footnote{82} Id. § 8005(d)(1). Specifically, the amount of qualifying SPEED resources which came online or received a certificate of public good from the Public Service Board between January 1, 2005, and July 1, 2012, must equal or exceed “total statewide growth in electric retail sales” during that time. Further, at least five percent of the total electric retail sales in 2005 must be provided by qualified resources that either came online during this period or received certificates of public good. However, if qualifying SPEED resources equal or exceed ten percent of 2005’s electric retail sales, the portfolio requirements will not come into effect. Id. § 8005(d)(1).

\footnote{83} Biennial Report, supra note 76, at 9.


\footnote{85} Id. at 8.
Although the current Vermont administration is officially in favor of commercial wind power, this position is not immediately evident in the 2011 CEP Public Review Draft. As to commercial wind, the CEP can at best be described as descriptive of the uses of wind power and potential problems with its use, without providing any quantified analysis that would lead to resolution of commercial wind power’s role in Vermont’s energy portfolio. Its recommended solutions to improve the section 248 process with regard to commercial wind power would require significant changes in PSB jurisprudence and procedure; this would appear to offer marginal improvements in certain respects. First, DPS suggests that it should either bolster its in-house aesthetics staff or sustain a long-term contractual relationship with outside aesthetics experts to better assist it in its section 248 role. Because the ANR has aesthetics as one of its statutory areas of review, it is unclear why this should be a DPS function. Further, as review of the aesthetics issues in PSB dockets concerning wind power will show, it is unclear whether more aesthetics input will actually be value-added until aesthetics experts themselves devise a more systematic and quantifiable method of aesthetics assessment. In this regard, it is not clear how the DPS’ second recommendation, that it, the ANR, and the PSB “should consider developing generic siting guidelines for developers of wind projects,” would accomplish its proposed goal of providing “guidance on aesthetics and other common issues,” in a meaningful way—generic concerns are not the issue, site-specific concerns are. Finally, and perhaps most importantly for purposes of this article, because of the manner in which aesthetic issues are handled in the section 248 process, even a more uniform method of aesthetics assessment does not mean that aesthetics will ordinarily trump societal benefit in the PSB’s decision making. Likewise, the second DPS recommendation has little obvious value in terms of the section 248 process, although it may meet certain administrative political requirements: mandatory mediation paid for by the developer at certain conditions.

87. See CEP, supra note 31, Vol. II, 123 (DPS recommends that Vermont utilities should purchase commercial wind power from sources in other states and Canada).
88. Id. at 115–22.
89. Id. at 140.
90. Id. at 123.
points in the section 248 process.\footnote{Id. at 124.} The rationale for this is that it would “provide an avenue for dispute resolution in Section 248 proceedings is used at points where parties are committed to finding solutions, rather than elevating litigation.”\footnote{Id. at 148.} Given the positions of many committed opponents of commercial wind power in Vermont, the value of such mediation in terms of process improvement would appear to be modest.

The issue for individuals and towns seeking to intervene in the formal section 248 proceedings is not so much the opportunity to be heard as it is finding the money to pay for the independent expert analysis that would be required to provide quantified, substantive pre-filed evidence to the PSB.\footnote{See Pre-Filed Testimony of Deborah Willey on Behalf of the Lowell Mountains Group at 2, Docket No. 7628 (Vt. Pub. Serv. Bd. Oct. 22, 2010), http://usmfiles.s3.amazonaws.com/phpskppQyl/Willey_testimony.pdf (“Once the turbines are sited, we will have little recourse but to try to endure the ill effects. We believe that studies by a neutral party should be carried out prior to authorizing the GMP project.”); Candace Page, \textit{Lowell Mountain Wind-project Opponents Carry on Despite Setbacks}, \textit{BURLINGTONFREEPRESS}, Jan. 30, 2011, http://www.windwatch.org/news/2011/01/30/lowell-mountain-wind-project-opponents-carry-on-despite-setbacks/ (explaining that lack of funds forces private wind power opponents to undertake only incomplete analysis or provide only opinion).} Review of intervenor submissions in the Lowell Mountain docket reveals sincere (if sometimes seemingly inconsistent) concerns, particularly regarding aesthetics and lifestyle value issues,\footnote{See, e.g., Prefiled Testimony of Roxanne Bedard on Behalf of the Lowell Mountain Group at 2, Docket No. 7628 (Vt. Pub. Serv. Bd. Oct. 22, 2010), http://www.kingdomcommunitywind.com/permitting/lmg-roxanne-bedard/ (although witness had no “clear, unobstructed ridgeline view of the proposed project” from her property, she was concerned about noise, “possibly the lighting of the turbines,” and the turbines’ impact on her family’s enjoyment of snowmobiling and four-wheeling).} but little of the substantive evidence that matters most before the PSB. What might prove more useful in meeting this concern is a mandatory fee to be paid by the developer at the time it proposes a project, which would be used to support intervenors in obtaining expert testimony, as New York’s new energy generation facility siting law provides for.\footnote{See Public Service Law, Art. X, § 163(4)(a) (McKinney 2012) (developer deposits $350 per MW of nameplate capacity into intervenor fund upon filing of preliminary scoping statement, up to a total of $200,000).}

DPS also recommends that the ANR continue with its natural resource inventory and mapping project, and that it consider rescinding its moratorium on building wind facilities on state land.\footnote{Id.} The ANR is responsible for the use of state lands, and its policy since 2004 is to ban
wind power development on lands owned by the state.\textsuperscript{97} This policy is based in part upon a working group’s findings that much state land is under deed restrictions that would not allow wind power development, and that such development is incompatible with the ANR’s stewardship mission.\textsuperscript{98} In December 2004, a commission established by the governor to determine whether the section 248 process was appropriate for wind power development made a number of recommendations to improve the process. The recommendations included that the PSB hold two public hearings in the project site region, and provide notice to towns within a ten-mile radius of the proposed project site.\textsuperscript{99} Other recommendations were not included, such as expanding the definition of “affected community” to include those towns within a ten-mile radius, rather than just the town hosting the project.\textsuperscript{100} The commission explicitly noted that, although there was “not statewide consensus on the development of large wind generation projects in Vermont,” its task had been only to assess the section 248 process.\textsuperscript{101}

In 2006, the ANR promulgated draft guidelines to review petitions for certificates of public good for wind power projects. These guidelines set out the ANR’s “expectations for pre- and post-construction data collection and general guidelines for construction, operation, and maintenance of utility-scale wind facilities.”\textsuperscript{102} Importantly, these guidelines not only define what constitutes undue adverse impacts with regard to animal mortality and bear habitat, for example, they also provide guidance on steps that can be taken to mitigate these impacts so that they are no longer significant.\textsuperscript{103} It does not appear that the ANR finalized these guidelines, but it is currently developing a plan to determine which state areas should be off limits to wind development based on wildlife and wildlife habitat considerations.\textsuperscript{104}

\textsuperscript{98} CEP Draft, supra note 31, at III-52.
\textsuperscript{100} Id. at III.
\textsuperscript{101} Id. at 4–12.
\textsuperscript{103} Id. at 25–29.
\textsuperscript{104} John Dillon, Administration Wants to Identify Areas Off Limits to Wind Energy, VERMONT PUBLIC RADIO (Feb. 14–15, 2011), http://www.vpr.net/news_detail/90040/. The plan will not be open to public participation, but will be informational in nature rather than regulatory, using existing maps
Vermont’s legislature has been active in the promotion of renewable energy in the state. Under the Vermont Energy Act of 2009, the General Assembly found that “it is reasonable to site wind energy generation facilities on state lands,” so long as there were no conflicts with federal or state law or a “specific restriction or covenant contained in a conveyance of an interest in the property to the state or one of its agencies or departments,” and that development maximized energy production while minimizing “environmental and aesthetic impacts.” The ANR was directed to report back to the legislature on the development of wind energy on state lands, but its response simply stated that the agency had neither received any new information regarding its policy, nor had it received any proposals to build wind power facilities on state land in the last year.

II. MUNICIPAL GOVERNMENT AND POLICY

A. Town Meetings

Although there are a number of small cities in Vermont, the predominant style of local government is the township. For the most part, even though townspeople elect officials to fill certain executive roles, important town decisions are made at annual or special town meetings by a majority vote of the town residents present. Vermont law authorizes towns to use the increasingly popular Australian (written) ballot for the residents to indicate their individual decisions at the town meetings. Town meetings traditionally occur on the first Tuesday in March. Every town resident has a right to be heard at a town meeting, but perhaps fewer than forty percent of the attendees on average comment during the debate and discussion of issues. Non-residents cannot speak at these meetings without authorization, nor can they vote. The modern significance and

showing the location of significant ecological communities in conjunction with commercial grade wind power maps to determine where wind turbines should not be built. Id.

108. Id. at 97.
109. Id. at 84. Many decisions continue to be made by voice vote, however. Id. at 87.
110. Id. at 85.
value of the town meeting has been questioned because of decreasing attendance on average, a perception that the meetings are swayed by special interest groups and the reliance that Vermont residents seem to place on the decisions of their elected land use planning board officials.

Surveys of elected town officials, however, have rated the quality of debate and decision-making at these meetings as generally either excellent or good. Beginning in 1974, when the town of Thetford voted to impeach then-President Nixon, special interest groups across the political spectrum have developed proposals to be voted upon by residents on issues varying from banning abortion to declaring nuclear-free zones. Some writers see the debate and decisions that occur on these issues in a positive light and consistent with traditional notions of American democracy. Regarding attendance, studies of Vermont town meetings suggest that the size of the town and the immediacy of the issue are the two most reliable predictors of how many registered voters actually attend town meetings. Generally speaking, the smaller the town, the greater the percentage of participation among the townspeople. Similarly, attendance is greater when controversial issues are discussed and are likely to have a tangible effect on people’s lives or livelihoods. For one writer, these two factors represent the best attributes of true democracy, which works best on a smaller scale when people are responsible for making the decisions that impact them directly, and when it deals with conflict and difficult issues in a pragmatic fashion. Importantly, then, Vermont’s practical political and legislative processes mean that the economic decisions that wind energy developers make on system siting and material are likely to be scrutinized by those who feel most affected by the developers’ decisions. As will be discussed in greater detail, although town decisions regarding wind power siting are not binding upon the PSB, they do appear to play a role in the equitable assessment of circumstances that the PSB conducts in deciding whether to

112. Id. at 93.
113. Id. at 97.
114. Id. at 99.
115. Id. at 100.
117. Id. at 49.
118. Id. at 74–78.
119. Id. at 233–34.
120. Id. at 252–53, 268–69, 294–95.
issue a certificate of public good so that a developer can begin construction.\footnote{B. Town Planning

In terms of documented town policy, the Londonderry Town Plan is an example of a municipal planning document that sets out the town’s opposition to commercial wind power in explicit terms. The Plan establishes a Resource Conservation District, the purpose of which is “to protect significant forest and scenic resources . . . and to prevent development on ridgelines . . . .”\footnote{Id. at 12.} Within the District, “energy generation facilities of any size, are prohibited,” as well as on any other land “characterized by one or more fragile natural features” such as ridgelines.\footnote{Id. at 13.} Londonderry recognizes its undeveloped mountain vistas as a critically important resource, and specifies Glebe Mountain as a prominent hillside that generates tourism revenue.\footnote{Id. at 17.} In the section dealing with Scenic Areas, the Plan notes that “[t]he Glebe Mountain ridgeline . . . is not only the town’s paramount scenic resource but also has regional significance,” and that “development on the ridgeline would irrevocably alter a highly visible, highly valued and highly visited landscape.”\footnote{Id. at 24.} Finally, the Plan notes that commercial wind power is particularly unsuitable for the town because of its possible negative impacts on the environment and the economy.\footnote{Id. at 41.}

The Town of Londonderry expressed its intent to protect Glebe Mountain in 2006, when residents voted against a proposed wind power project on the mountain at a town meeting.\footnote{Id. at 19.} Shortly thereafter, the town filed a detailed recommendation with the PSB against the project before the
developer had even submitted a petition for a certificate of public good, and residents in the area committed to raising $100,000 to fund legal challenges against the project. The developer withdrew from the project, citing local resistance and regulatory uncertainty. As will be seen in the analysis of PSB wind power dockets, the local and regional plans applicable in those cases are perhaps more accurate indicators of Vermont town plans in general regarding the localized suitability of wind power, in that they do not contain the same degree of specificity regarding the use of commercial wind power.

III. THE SECTION 248 PROCESS

The PSB rules require applicants for new electricity generation projects to submit detailed construction plans to “affected municipal and regional planning commissions, and municipal legislative bodies” 45 days prior to submitting the petition for the certificate of public good to the PSB. If the proposed project is a wind power generation facility, then “affected” organizations are defined as those municipal governments and municipal and regional planning commissions within a ten-mile radius of any turbine. This notice requirement provides these towns and commissions with the opportunity to submit recommendations to the PSB, regardless of whether they are granted “party status” to the proceedings on the petition. At the time the petition is filed, the petitioner must also provide notice to adjoining landowners. The PSB may conduct workshops on proposed projects to allow potentially interested parties to obtain technical information on the proposed project prior to discovery.

At a minimum, a complete petition must include: (1) a U.S. Geological Survey topographic map of the proposed project’s location, (2) an annotated
aerial photograph of the project site, (3) a detailed site plan, (4) pre-filed
evidence composed of testimony and exhibits that describe how the
proposed project meets all the relevant assessment criteria, and (5) an
index.\textsuperscript{135} Although the PSB may conduct site visits of the proposed project
location, information from the visits does not become evidence unless the
PSB specifically enters the information into the evidentiary record, either
\textit{sua sponte} or at the request of a party to the proceedings.\textsuperscript{136} The PSB holds
public hearings on petitions\textsuperscript{137} at which members of the public may speak or
provide written comments,\textsuperscript{138} but members of the public are not allowed to
participate in evidentiary hearings unless they have intervened and become
formal parties.\textsuperscript{139} Parties can submit pre-filed evidence after discovery\textsuperscript{140}
and call witnesses, who will be subject to cross-examination by other
parties and the PSB, to testify at the evidentiary hearing.\textsuperscript{141} Parties may file
briefs at the conclusion of the evidentiary hearing, before the PSB issues its
order.\textsuperscript{142}

The DPS, representing the public interest regarding energy matters, and
the ANR automatically appear as formal parties in cases.\textsuperscript{143} The DPS
provides evidence and recommendations on whether the project would

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\textsuperscript{135} PSB Rules, supra note 126, at \textsection 5.402(C)(1).
\textsuperscript{136} \textit{Id.} \textsection 5.405.
\textsuperscript{137} \textit{Id.} \textsection 5.406.
\textsuperscript{138} “Vermont law requires the Board to base its decisions on the evidence presented by the
parties during the evidentiary hearings. Even though we cannot rely upon them as evidence, public
comments provided a crucial role in offering fresh perspectives and bringing up new issues that the
Board should take under consideration. In particular, they assisted us in formulating questions that we
were then able to pose to the parties and witnesses during the technical hearings.” Georgia Mountain,
supra note 39, at 8.
\textsuperscript{139} VT. PUB. SERV. BD., CITIZEN’S GUIDE TO THE VERMONT PUBLIC SERVICE BOARD’S
SECTION 248 PROCESS 2–3 [hereinafter Citizens’ Guide], available at
regulations, the PSB may permit intervention by parties only upon certain issues. 18-1 VT. CODE R.
\textsection 2.209(C) (2011); see, e.g., UPC Vermont Wind, 2009 VT 19, ¶ 5, 185 Vt. at 300–01, 969 A.2d at 148,
n.1 (noting that appellant had only been permitted to intervene on issues such as “orderly development
of the region, the economic impact of the project, aesthetics and other environmental issues, and impact
on outstanding resource waters”).
\textsuperscript{140} Citizens’ Guide, supra note 135, at 7–8; 18-1 VT. CODE R. \textsection\textsection 2.213(C), 2.214(B) (2011).
\textsuperscript{141} \textit{Id.} at 9; 18-1 VT. CODE R. \textsection 2.215 (2011). The PSB Rules incorporate the Vermont Rules
of Civil Procedure and the Vermont Rules of Evidence. \textit{Id.} \textsection\textsection 2.103, 2.216.
\textsuperscript{142} Citizens’ Guide, supra note 135, at 9; 18-1 VT. CODE R. \textsection 2.223 (2011).
Although it accords them appropriate weight, the PSB is not bound by conclusions of adverse impact
made by state agencies. See, e.g., Sheffield, supra note 32, at 74–81 (disagreeing with the Department of
Historic Preservation’s finding of adverse impact on a historic site), nor even more technical
assessments such as whether a natural community as rare and irreplaceable. E.g., Georgia Mountain,
supra note 39, at 68.
\end{flushleft}
“unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions,” and whether it is necessary “to meet the need for present and future demand for service,” which could not otherwise be satisfied through energy conservation, efficiency, and load management measures. The DPS also provides testimony as to the impact of the project on the electrical system’s stability and reliability, and whether the project will provide “an economic benefit to the state and its residents.”

The ANR provides evidence and recommendations on whether proposed projects present “undue adverse effect[s] on esthetics, historic sites, air and water purity, the natural environment and public health and safety.” The criteria which guide the scope and content of the ANR’s testimony before the PSB include those that the PSB itself must consider under title ten, sections 1424a(d) and 6086(a)(1)–(8), (9)(K) of the Vermont Statutes. Through this process, the very comprehensive environmental impact assessment required by Vermont’s Act 250 governing development, in general, is incorporated into the PSB’s deliberations. Thus, in its testimony before the PSB, the ANR potentially addresses 14 separate criteria pertinent to “outstanding resource waters.” These criteria include, among other things: water quality, wildlife impacts, and scenic or natural uniqueness. Complementing this assessment of water quality, the ANR must also address whether the project would result in adverse impacts such as undue water or air pollution, soil erosion, and unreasonable burdens upon affected municipalities’ ability to provide educational services. These additional criteria, in certain cases, add to the 14 quality criteria.

145. Id. § 248(b)(2).
146. Id. § 248(b)(3).
147. Id. § 248(b)(4).
148. Id. § 248(b)(5).
151. VT. STAT. ANN. tit. 30, § 248(b)(1); tit. 10, § 1424a(d) & § 6086(a)(1)–(8), (9)(K) (2008)).
152. VT. STAT. ANN. tit. 10, § 1424a(d)(1)–(8) (2010). These are the same criteria used by the Water Resources Panel of the Natural Resources Board to determine whether a water qualifies as an Outstanding Resource Water. Id. § 1424a(a).
153. Id. § 6086(a)(1); (4), (6).
assessments, such as the adverse impact of the project on wildlife habitat or endangered species\(^{154}\) and “the waters’ value in providing or maintaining habitat for threatened or endangered plants and animals.”\(^{155}\)

Some of these 14 outstanding resource water criteria are particularly applicable to wind power project applications. For example, applicants must show that the project “will meet any applicable health and environmental conservation department regulation regarding the reduction of the quality of the ground or surface waters flowing through or upon lands which are not devoted to intensive development and which lands are . . . above 1,500 feet elevation.”\(^{156}\) The ANR’s assessment of whether there are undue adverse impacts to the environment relies on precedential Act 250 decisions from the District Commissions and the Environmental Court.\(^{157}\) Consistent with its Draft Guidelines, the ANR’s pre-filed testimony not only determines whether there are undue adverse impacts, but it also sets out the mitigation measures it believes necessary to reduce the impacts to acceptable levels.\(^{158}\) The ANR provides evidence and recommendations directly to the PSB on particular projects, and the petitioner can appeal the ANR’s permitting decisions, related to the same projects, to the PSB for review. For example, an interested party might contest a project’s application for a storm water permit from the ANR. Before 2009, if the permit was issued, the contesting party could appeal directly to the Vermont Environmental Court.\(^{159}\) Now, because of a legislative change, the contesting party now must bring its appeal to the PSB for its decision on review.\(^{160}\)

\(^{154}\) Id. § 6086(a)(1)(8)(A).

\(^{155}\) Id. § 1424a(d)(5).

\(^{156}\) Id. § 6086(a)(1)(A); Id. § 6086(a)(1)(A)(iii).


\(^{158}\) Georgia Mountain, supra note 39, at 22.

\(^{159}\) See, e.g., In re Sheffield Wind Project (Appeal of Brouha et al.), Docket No. 252-10-08 Vtec (Vt. Environmental Court, Oct. 19, 2009).

\(^{160}\) VT. STAT. ANN. tit. 10, § 8506 (2010). Because of the backlog in the Environmental Court’s docket, this change has had a positive effect in terms of both reducing the time required for a developer to begin construction and to increase predictability in the process. Interview with Rep. Tony Klein, Chair, House of Reps. Natural Res. and Energy Comm. (Jun. 14, 2011).
IV. PSB WIND POWER JURISPRUDENCE

A. Public Safety and Health

Of the more significant issues litigated before the PSB in wind power docketts, questions concerning the impact upon public safety and health have tended to be the least controversial, at least in terms of actual evidence produced. Public safety issues in particular are non-controversial because mitigation measures, such as restricting access to wind power facilities and reducing operations during certain times in the winter, are sufficient to largely eliminate possible injuries from ice throw. Concerns as to the possible impacts of annoying shadow flicker or flash from the turbine rotors have not figured prominently in Vermont, although they are more significant in Northern Europe given its higher latitudes and denser population. The most significant health issue arising from wind facilities is sound. Different kinds of sound are generated by turbine operation, but “much of the noise emitted from the turbines is masked by ambient or the background noise of the wind itself.” However, reports from at least one wind facility in Maine show that nearby residents are disturbed by noises they characterize as “whooshing,” “roaring,” “thumping,” and “grinding,” even inside their homes with the windows closed. Some people may be affected by infrasound, which is defined as sound below the normal range of hearing. The PSB has consistently required that wind facilities meet accepted national and international noise levels applicable to audible sound,

161. When ice builds up on turbine blades, it can fall to the ground or be thrown off the blades as they warm up and continue to rotate. MANWELL, supra note 29, at 505. See Georgia Mountain, supra note 39, at 29–30 (explaining how restricted access and operational adjustments mitigate danger of ice throw).
162. “Shadow flicker occurs when the moving blades of the wind turbine rotor cast moving shadows that cause a flickering effect, which could annoy people living close to the turbine.” MANWELL, supra note 29, at 508. See Georgia Mountain, supra note 39, at 29 (explaining the impacts of the shadow flicker phenomenon).
164. MANWELL, supra note 29, at 508.
165. Id. at 481, 485–87.
166. Andy Stone, More Complications for Wind Power in Maine: Local Residents React to Excessive and Unexpected Noise, VT. J. ENVTL. L. (Jan. 29, 2010), http://www.vjel.org/news/NEWS100228.html. The Dynapower turbine in S. Burlington is smaller than those proposed for commercial generating facilities, but standing under it one hears at best a soft swishing sound. Author’s notes, Aug. 8, 2011. If the gearing inside the turbine nacelle is not kept serviceable, however, mechanical noises could result.
which are not problematic to measure. However, “because of the wide variation in the levels of individual tolerance for noise, there is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction.”

B. Economic and Societal Benefit

A finding of economic benefit, a component of societal benefit, does not require a specific quantitative conclusion, although it is based largely on quantitative factors, such as additional dollars of tax revenue and estimated numbers of new jobs. The PSB only needs to find that the development will be of some economic benefit. The requirement of only “some” benefit appears to be qualified by the PSB’s position that this must include stably priced, long-term sales contracts to be of sufficient value to justify a finding that the facility will promote the general good of the state. The two primary arguments that opponents of wind power facilities have raised in the PSB dockets are the plants’ negative impact on property values and tourism. In three of the four dockets studied, wind project opponents were unable to establish any credible empirical basis for decreases in either property values or tourism attributable to wind power generation plants. In Deerfield, the PSB even found evidence to the contrary: not only did an

168. See Georgia Mountain, supra note 39, at 57 (finding economic benefit in the absence of specific quantitative conclusion); Sheffield, supra note 32, at 72–73; Deerfield, supra note 39, at 6.

169. Manwell, supra note 29, at 481.


172. Georgia Mountain, supra note 39, at 80–83; Sheffield, supra note 32, at 36–42. The Vermont Supreme Court has found the PSB to be acting properly within the scope of its duties in conditioning the grant of a certificate of public good upon good faith efforts to secure these sorts of contracts. UPC Vermont Wind, 2009 VT 19, ¶ 9, 185 Vt. at 302, 969 A.2d at 149. Central Vermont Public Service has agreed to buy 2/3rds of the Deerfield project’s output for nine years. CVPS to purchase Deerfield Wind power, CENTRAL VERMONT PUBLIC SERVICE (Sep. 9, 2010), http://www.cvps.com/aboutus/news/viewStory.aspx?story_id=295.


174. Deerfield, supra note 39, at 33; Sheffield, supra note 32, at 32; Georgia Mountain, supra note 39, at 24.
adjoining town “not reduce the appraised value of properties that have views of the Searsburg turbines,” no one had ever appealed their assessment on the basis of a reduction in value because of a view of the turbines. The PSB also found that the Searsburg plant “served as a tourist draw.” In East Haven, the hearing officer’s recommendation to the PSB that a certificate be denied on grounds that it would jeopardize the public investment in the natural areas around the proposed project site, because of its shocking and offensive impact on visitors, could be interpreted as finding a negative impact on tourism. The PSB, however, rejected this portion of the hearing officer’s recommendation because the likely users of the natural areas, hunters and snowmobilers, were not likely to have their experiences negatively impacted by the wind turbines.

C. Wildlife and Wildlife Habitat

In the four cases above, the most contentious issues regarding wildlife appear to be whether there are undue adverse impacts on birds, bats and bears. Evaluations of studies conducted on bird and bat mortality have shown that, in general, deaths caused by wind power facilities are relatively few. There appears to be a significant amount of uncertainty in the actual mortality rates, however. For example, the most common types of birds killed are songbirds. While songbirds are very common, they also tend to be quite small, meaning that it is easy to overlook carcasses when conducting mortality studies, and for scavengers to dispose of carcasses quickly. Studies do suggest that larger types of birds such as raptors favor mountain ridgelines on the eastern edge of the Appalachian Mountains as migratory pathways, and that in the Eastern U.S. “more birds may be

175. Deerfield, supra note 39, at 29.
176. Id. at 35.
177. East Haven, supra note 39, at 44, 52, 54, 56.
178. Id. at 102. This finding by the PSB would appear to be inconsistent with its ordinary interpretation of “average” person.
179. ENVIRONMENTAL IMPACTS OF WIND-ENERGY PROJECTS, COMMITTEE ON ENVIRONMENTAL IMPACTS OF WIND ENERGY PROJECTS, NATIONAL RESEARCH COUNCIL 71–72 (2007) [hereinafter NRC STUDY].
181. NRC Study, supra note 175, at 74. Scavenger and searcher efficiency studies conducted at the Maple Ridge wind facility in New York found that “carcass removal rates were modest.” Maple Ridge Study, supra note 176, at 2.
182. NRC Study, supra note 175, at 88.
killed at wind-energy facilities on forested ridge tops than in other regions.\footnote{183} Generally, bat fatalities in the Eastern U.S. along forested ridge tops are significantly higher than in the West.\footnote{184} The proposed wind facility project on East Mountain in \textit{East Haven} was rejected by the PSB because the developer had not provided sufficient information regarding the proposed project’s impact on bird and bat populations.\footnote{185} In projects that had sufficient fieldwork conducted to assess potential impacts on birds, the identified bird populations for the most part were fairly stable.\footnote{186} Bat populations in Vermont are under significant pressure because of their low reproductive rate and the devastating effects of White-Nose Fungus.\footnote{187} The impact of even relatively low bat fatalities on different bat species is uncertain.\footnote{188} The PSB has not accepted the ANR recommendations to set specific quantitative mortality thresholds for bats.\footnote{189} Instead, it has conditioned certificates on two elements: (1) pre- and post-construction studies to generate data to provide greater certainty in this area and (2) mitigation measures planned on the basis of sufficient fieldwork having been completed.\footnote{190}

\begin{itemize}
\item \footnote{183} Id. at 75.
\item \footnote{184} Id. at 95.
\item \footnote{185} East Haven, supra note 39, at 90, 104. The developers petition noted only that there were no known federal or state-listed endangered or threatened bird species at the proposed site, that it did not appear to be suitable habitat for any listed species, and that there was likely “a small but not ecologically significant risk of habitat disturbance” resulting from the project. Petition of EMDC, LLC, d/b/a East Haven Windfarm, ¶¶ 86–87, at 17, Docket No. 6911 (Vt. Pub. Serv. Bd. Nov. 17, 2003).
\item \footnote{186} See \textit{Deerfield}, supra note 39, at 79–80; \textit{Sheffield}, supra note 32, at 89–95 (finding population stability after sufficient fieldwork). \textit{But see Georgia Mountain, supra note 39, at 70–72 (failing to make a stability determination because of insufficient fieldwork)).
\item \footnote{187} Reed Elizabeth Loder, \textit{Breath of Life: Ethical Wind Power And Wildlife}, 10 \textit{VT. J. ENVTL. L.} 507, 516 (2009).
\item \footnote{188} See \textit{VT. AGENCY OF NATURAL RES., ENDANGERED AND THREATENED SPECIES TAKING GENERAL PERMIT FOR THE TAKING OF NAMED BATS (2011), available at http://www.vtfishandwildlife.com/library/Reports_and_Documents/NonGame_and_Natural_Heritage/2011_General_Permit_for_Incidental_Take_of_Bats%20A_and_App_1.pdf} (placing little brown bats and Northern long-eared bats on the Vermont Endangered Species list, effective July 15, 2011, due to WNS-caused population decreases; four bats may be taken per annum under certain conditions per general permit).
\item \footnote{189} Georgia Mountain, supra note 39, at 75; \textit{Sheffield}, supra note 32, at 101; \textit{Deerfield}, supra note 39, at 82–83.
\item \footnote{190} Georgia Mountain, supra note 39, at 75 (requiring two years of study on bat fatalities); \textit{Deerfield}, supra note 39, 82–83. The PSB appeared to very favorably regard the detailed agreement that the Sheffield developer had entered into with the ANR to conduct bird fatality studies and undertake bat fatality mitigation measures, in part because of the length of time over which initial studies had been conducted and the focused nature of the studies. \textit{Sheffield}, supra note 32, at 93–101.
\end{itemize}
Black bears are not an endangered species in Vermont, but bear populations and habitat are protected. The PSB must give due consideration to whether the project will destroy or significantly imperil “necessary wildlife habitat.” Necessary wildlife habitat is defined as “concentrated habitat which is identifiable and demonstrated as being decisive to the survival of a species of wildlife at any period in its life including breeding and migratory periods.” The PSB has described “due consideration” of this criterion as not requiring a finding that the project will in fact have this specific effect, but rather whether the habitat in question is “clearly extremely important.” If so, then the next questions are: “whether the impacts can be mitigated, and whether the project could be built on alternative locations under the control of the petitioner.” As to mitigation, the ANR guidelines require at least a 4:1 ratio to mitigate the loss of bear habitat, and the Deerfield certificate was granted in part on other high quality bear habitat being preserved in this ratio. In Sheffield, however, the ratio was significantly greater: 2,700 acres of unfragmented forestland in exchange for the 63 acres cleared during construction. Coupled with indirect mitigation measures, such as continuing studies on the effect of wind turbines on bear behavior and population, bear habitat set-offs have satisfied the PSB that there will be no undue adverse impact to

191. Vermont’s Bear Hunting Season is Sept. 1—Nov. 17. VERMONTHUNTINGTODAY.COM, http://vermonthuntingtoday.com/blog/index.php/category/vtfg-news/ (“Vermont’s bear population is healthy and estimated at more than 5,500 black bears, according to the Vermont Fish and Wildlife Department. The bear population has increased slowly for the last two decades, and regulated hunting is used to control the population’s growth.”).


193. Deerfield, supra note 39, at 73.


195. Deerfield, supra note 39, at 75.

196. Id.

197. Sheffield, supra note 32, at 85.


199. Sheffield, supra note 32, at 20, 86–87 (highlighting the fact that it was likely the size of the parcel, not its quality, which was substantially lower than that in Deerfield, that convinced the ANR to call it an “outstanding” conservation measure). Although the parcel in Sheffield was significantly larger than that required by the ANR’s guidelines, it is not clear that the parcel contained the same high-quality, high altitude bear habitat as the set-off parcel in Deerfield. Id. at 20, 87. The size of the Sheffield parcel likely helped the developer in its negotiations with the ANR, and the PSB recognized it as an “outstanding” conservation measure. Id. at 86–87.

200. Deerfield, supra note 39, at 78. But see Id. at 104–05 (dissenting from the majority’s opinion, Commissioner John D. Burke found that the impacts on the bear population were so severe that they could not be mitigated, even by the set-off).
bear populations. With regard to alternative locations, the PSB has been satisfied with a showing by the developer that alternatives were not economically viable in terms of “wind resources, proximity to transmission lines, constructability, and other factors.”

D. Aesthetics

Although the ANR draft guidelines generally set out the sort of information petitioners need to gather regarding aesthetics, the ANR need not provide an agency assessment of aesthetics in its pre-filed testimony. Under Vermont law, the legal test to determine whether a project will have an undue adverse effect upon aesthetics is the so-called Quechee test. Under this test, the PSB first must determine “whether a project will have an undue adverse effect on the aesthetics or scenic and natural beauty of an area” because it would not be in harmony with its surroundings. If a proposed project fails to meet this first part of the test, then the PSB will find the impact to be unduly adverse if it violates “a clear, written community standard intended to preserve the aesthetics or scenic, natural beauty of the area,” if it “offend[s] the sensibilities of the average person,” or if “the applicants failed to take generally available mitigating steps that a reasonable person would take to improve the harmony of the proposed project with its surroundings.” Case law and Environmental Board jurisprudence only require that one of the criteria be met for the adverse impact to be considered undue under Act 250. Appropriate and practicable mitigation measures may, however, overcome otherwise undue impacts of a proposed project regarding all three criteria. Although case studies have identified a number of common issues, such as aesthetics and

201. Id. at 78. In a related area, however, the PSB has denied a developer’s petition to erect a wind turbine because he had failed to take appropriate mitigating steps to locate it so that it was not in such close proximity to an adjoining landowner. In re Petition of Tom Halnon, 174 Vt. at 514–516, 811 A.2d at 162–63.


203. Although VT. STAT. ANN. tit. 30, § 248(a)(4)(E) (2008) sets an aesthetics assessment as an ANR duty, as will be discussed infra, DPS provided it in the Lowell docket.

204. In re Petition of Tom Halnon, 174 Vt. at 515, 811 A.2d at 163.

205. Id.

206. Id.

207. Id.

208. In re Eastview at Middlebury, Inc. (Miriam Roemischer, Appellant), 2009 VT 98, ¶¶ 20, 21, 107 Vt. 208, 219–20, 992 A.2d 1014, 1021–22 (2009); see also In re McShinsky153 Vt. at 572, 592 A.2d at 920 (implying that mitigation attempts such as setback from adjacent landowners, site location, and design elements of the proposed project may provide sufficient mitigation could be sufficient to prevent an undue adverse impact).
mortality of birds and bats, the studies did not address the particularized issue of ridgeline aesthetics in states where that is protected under state law.\footnote{209. See, e.g., NAT’L WIND COORDINATING COMM., WIND POWER FACILITY SITING CASE STUDIES: COMMUNITY RESPONSES 6 (2005), available at http://www.nationalwind.org/assets/publications/NWCC_Siting_Case_Studies_Final.pdf (listing four public concerns associated with wind power development, but not including ridgeline aesthetics).}

As addressed earlier, the 
Quechee test has three prongs. First, the clear, written community standard must be very specific regarding the designation and preservation of scenic resources.\footnote{210. UPC Vermont Wind, 2009 VT 19, ¶ 24, 185 Vt. at 308, 969 A.2d at 153.} Second, the project may not offend the sensibilities of the “average” person, who is informed as to the benefits of wind power and has no personal interest in whether the project goes forward.\footnote{211. Sheffield, supra note 32, at 68.} Offending sensibilities has been interpreted to mean “shocking and offensive,”\footnote{212. Id.; Georgia Mountain, supra note 39, at 54; Deerfield, supra note 39, at 62.} but the PSB has noted that, just because a development is out of character with its surroundings, it does not mean that the project will fail the 
Quechee test.\footnote{213. See Sheffield, supra note 32, at 68 (positing that when viewing distances are such that the size of the wind turbines is not overwhelming, the PSB believes the average person is neither shocked nor offended). Nor does development being out of character mean that it is so shocking and offensive that it would have an undue adverse impact. UPC Vermont Wind, 2009 VT 19, ¶ 34, 185 Vt. at 311, 969 A.2d at 155 (explaining the Board’s finding that just because a project is “out of character” with the surrounding area, does not render it shocking or offensive). See also Georgia Mountain, supra note 39, at 17 (finding that wind turbine development is consistent with existing uses such as logging).} Third, a developer must take “generally available mitigating steps” to pass the 
Quechee test.\footnote{214. Georgia Mountain, supra note 39, at 32, 68; Sheffield, supra note 32, at 68; The Vermont Supreme Court has affirmed this approach. See UPC Vermont Wind, 2009 VT 19, ¶ 28, 185 Vt. at 309, 969 A.2d at 153–54 (confirming the approach taken in Sheffield).} As the PSB noted in Sheffield, the developer need only take “the generally available mitigating steps which a reasonable person would take to improve the harmony of the project with its surroundings.”\footnote{215. Id.} For example, “[i]t is not possible to provide screening for a 420-foot wind turbine and consequently mitigate the visibility of the project.”\footnote{216. Sheffield, supra note 32, at 68; The Vermont Supreme Court has affirmed this approach. See UPC Vermont Wind, 2009 VT 19, ¶ 28, 185 Vt. at 309, 969 A.2d at 153–54 (confirming the approach taken in Sheffield).} There are physical and equitable aspects to mitigating adverse visual impact. Physical measures include burying transmission lines on the ridgeline, minimizing areas to be cleared, using existing access roads, using light-colored turbine components, reclaiming areas that had been cleared for construction, and siting the project near existing transmission lines or a load center.\footnote{217. MANWELL, supra note 29, at 476–79; Georgia Mountain, supra note 39, at 13, 15, 55; Sheffield, supra note 32, at 68.}
carries an additional equitable consideration because the people bearing the adverse visual impact are the same people who derive benefit from the wind turbines.218

The balancing of any adverse aesthetic impact against the “overall societal benefits of the project” to determine whether it is undue further distinguishes the section 248 process from the Act 250 process.219 Moreover, the PSB has noted, “in approving wind generation facilities in particular, we balance the significant societal benefits of wind power against its aesthetic impacts.”220 Such benefits include: diversifying the state’s energy portfolio;221 reducing air pollution generally;222 reducing CO2 emissions in particular;223 creating new jobs and tax revenues;224 reducing costs to Vermont energy consumers through the use of stably-priced, long-term contracts;225 stimulating local economies through procurement of materials required to construct the facility;226 and lease payments to landowners hosting the facility.227 The PSB also considers the enhanced impact of these economic benefits on economically disadvantaged areas.228

E. Public Support

The section 248 process is intended to provide an objective and holistic analysis of whether a project promotes the public good. Just because an affected town is against hosting a particular project does not mean that the PSB will disapprove a petition for a certificate of public good. However, it would be naïve to assume that the PSB is not conscious of the level of public support for a project. The PSB factors the degree to which the affected communities support or disapprove of a project into its section 248 analysis. For example, federal,229 regional,230 and town development and

218. Georgia Mountain, supra note 39, at 3.
219. Id. at 51, 54.
220. Deerfield, supra note 39, at 61.
221. Georgia Mountain, supra note 39, at 81.
222. See id. at 36, 81 (explaining the concessions made by the Board due to the air quality benefits the final project will yield).
223. Id. at 81.
224. Id. at 25.
225. Id. at 81; Sheffield, supra note 32, at 35–36; Deerfield, supra note 39, at 42–44. Such contracts have been heavily weighted by the PSB in its economic benefit analysis and overall findings of public good. Id.
227. Id. at 31.
228. Deerfield, supra note 39, at 27.
229. See id. at 18, 61–62 (considering federal documents related the Green Mountain National Forest in the PSB’s determination).
land use plans are considered by the PSB. In the four cases examined by the PSB, however, the development and land use plans did not play a determinative role. First, the section 248 process only requires that the plans be given “due consideration.” Second, the plans evaluated by the PSB were neither specific enough regarding particular landscape features to be protected, nor did they reject the possibility of wind power being developed. Zoning ordinances were specifically deemed inappropriate for setting community standards in this regard, because it is possible to obtain variances, and because zoning ordinances do not apply to energy generation projects under section 248. Third, because regional plans account for different development proposals within a town’s decision-making power, the PSB noted that only the plans of towns where the wind turbine facilities are actually located are applicable.

For town opposition to wind power to register in the PSB’s assessment, it would likely need to be expressed as explicitly as Londonderry’s plan does. This would require majority support within a town for prohibiting commercial wind, likely obtained through the town meeting process. Conversely, the PSB appears to accept the proposition that a town voting in favor of a commercial wind power project demonstrates that the town believes the project is consistent with its orderly development. In the Deerfield docket, the PSB found that there would be no interference with orderly development or negative impacts on activities that currently took

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230. See id. at 17, 62 (stating that a list of goals and policies are not clear, written community standards).


232. Georgia Mountain, supra note 39, at 17–18, 53; see id. at 52 (quoting In re Halnon Order at 22 n.5, CPG NM-25 (Vt. Pub. Serv. Bd. Mar. 15, 2001), http://www.state.vt.us/psb/orders/2001/files/cpgnm25_final_order.pdf) (“In order for a provision to be considered a clear, written community standard, it must be ‘intended to preserve the aesthetics or scenic beauty of the area’ where the proposed project is located and must apply to specific resources in the proposed project area.”); see also id. at 17 (noting that merely citing a scenic resource as a “noteworthy” land feature is insufficient); Deerfield, supra note 39, at 62 (stating that a list of goals and policies are not clear, written community standards).

233. Georgia Mountain, supra note 39, at 19, 53.

234. Id. at 53; UPC Vermont Wind, 2009 VT 19, ¶¶ 11–20, 185 Vt. at 303–07, 969 A.2d at 150–52.

235. Sheffield, supra note 32, at 27; see also id. at 67 (applying the municipal plans of neighboring towns “would undermine the municipal planning process by allowing municipalities to make planning decisions for neighboring towns”).
place on the lands surrounding the project, in large part because the two towns hosting the proposed facility were in favor of it.236

The determination of whether there is an economic benefit also provides an indirect entry point for the possible consideration of public support. Potentially, the wider the economic benefits are distributed, the greater the support among the citizens of the entire state. Further, the section 248 process does not restrict the PSB to considering only the specific criteria set out in the statute in a narrow, technical fashion. For example, the PSB also considers state energy policy with regard to renewable energy as a factor. In the absence of any comprehensive wind statutes or policies established by the state, the existing framework of renewable energy laws and regulations provides a sense of the goals the citizens of the state support, as implemented by their elected legislators and governor. Finally, the PSB appears receptive to equitable considerations regarding sharing the burden of environmental impacts. In the Georgia Mountain docket, for example, the PSB noted favorably that the wind power facility would be located closer to the load center, and therefore the visual impact of the facility would be borne in significant measure by those who used its electricity.237

The indirect inclusion of indicia of public support through these limited means is likely necessary to keep the section 248 process objective in its holism. In particular, a consideration of the opposition to commercial wind shows why this is so, especially when the project being considered generates conflict between competing positive environmental values and concerns. The term “NIMBY” is too general a description to be useful in understanding the opposition to wind power projects in Vermont.238 The

236. Deerfield, supra note 39, at 19–20; Tena Starr, Windfarms may yet crop up on the Vermont horizon, VTDIGGER.ORG (Mar. 30, 2010), http://vtdigger.org/2010/03/30/windfarms-on-the-horizon-that-could-have-been-blown-away-may-crop-up/.

237. Georgia Mountain, supra note 39, at 3. One writer has made note of balancing all of these concerns in Vermont: The time for efficient industrial wind farms is here. Our culture can adapt to restrained aesthetic changes of inland turbines dotting carefully-selected mountain ridgelines. Some public lands are suitable for this kind of shift in vital energy priorities. Every region has a collective ethical responsibility to evaluate its geographic resources and to consider accepting some impacts to contribute to its fair share. These priorities, however, do not justify loosening otherwise important environmental protections and streamlining processes that safeguard environmental values.

Loder, supra note 184, at 530–31. Careful selection is precisely the issue.

238. See Rathke, supra note 86 (noting that Sheffield residents in opposition to wind power project typify a general state concern with preserving scenic vistas).
individuals and groups opposing commercial wind projects often do not do so because they are being selfish; rather, they are reflecting, at the local level, a statewide perspective regarding the aesthetic and environmental value of ridgelines in general.\(^{239}\) They are not opposed to wind power in general,\(^ {240}\) but some believe that they are being asked to shoulder more than their fair share of energy generation needs.\(^ {241}\) There are also concerns that relatively poor towns find themselves overwhelmed financially, culturally, and legally by out-of-state corporations espousing values very different from their own.\(^ {242}\)

The national and international nature of the energy situation may have an impact on the degree of public support, and complicates the equities that potentially undergird those positions. To increase its portfolio of energy from renewable resources, Green Mountain Power (GMP) and Central Vermont Public Service (a major state utility with which GMP merged)\(^ {243}\) received PSB approval to purchase 55% of the electricity generated by a wind facility in Coos County, New Hampshire.\(^ {244}\) Certain Vermont utilities, including GMP, have recently signed contracts with Hydro-Québec (a Québécois government-owned company) for the purchase of hydropower
generated in Canada. 245 Gaz Métro, a Québécois company, owns GMP. 246 In Québec, the new construction of hydro generation facilities to make electricity to sell to the U.S. is controversial because of the creation of new large reservoir and dam systems that will significantly change the environment on and around currently undammed rivers. 247 Although the PSB has shown it is attentive to trans-national equities, 248 an assessment that is too holistic risks becoming paralyzed by its own analysis, 249 and would lead to the consideration of issues outside the scope of the PSB’s statutory remit. 250

V. CASE STUDY: THE LOWELL MOUNTAIN PROJECT

Although the PSB has only rejected one commercial wind power petition, some proposed projects have been abandoned during the certificate of public good process, and some have been abandoned before petitions were even filed. The Lowell Mountain wind station project, approved by the PSB in May 2011, provides a very good example of a developer who


247. Marsden, supra note 236.

248. See Robin Smith, Derby Wind: PSB Says Project Must Notify Canadians, ORLEANSCOUNTYRECORD (March 8, 2012), http://orleanscountyrecord.com/main.asp?SectionID=7&SubSectionID=32&ArticleID=21137 (wind power facility developer must notify Canadian towns within ten mile radius viewed); Petition of twenty Vermont Utilities, Docket No. 7670, 48 n. 32 (Vt. Pub. Serv. Bd. April 15, 2011) (“the Board’s previous orders have made clear that the Board has jurisdiction over environmental impacts of generation projects beyond the state only to the extent that those impacts affect the general good of the state”).

249. See Sebastian Rietjens & Joseph Soeters, Measuring the Immeasurable? The Effects-Based Approach in Comprehensive Peace Operations, 34 INTL. J. PUB. ADMIN. 329, 332–34 (2011) (using holism in assessing a complex system, such as rule of law development, is difficult to quantify and standardize).

250. From an equitable and global environmental point of view, a case could potentially be made that although the Québécois are willing to modify their environment drastically to be able to sell Vermonters the “clean” energy they seem to want, building wind facilities in Vermont might have a lesser overall environmental impact.
appears to have studied the politics of wind power in the PSB process and implemented an outreach program to the community of Lowell to provide information to the residents that was significant in achieving town approval for the project. Further, the developer, a joint venture between Green Mountain Power Corporation, the Vermont Electric Power Company, and Vermont Transco LLC, called Kingdom Community Wind (KCW), appears to have effectively analyzed prior PSB wind power dockets. Additionally, they have worked closely with the ANR to achieve a significant degree of consensus with the agency on several controversial issues both prior to and during the pre-filed testimony process before the PSB. The PSB certificate of public good issued in this docket is still being appealed in part by both the developer and opposing interveners, but analysis of it yields important insights into the application of PSB precedent to wind power issues.

A. Developer Outreach

Kingdom Community Wind, a consortium of GMP, Vermont Electric Cooperative, and Vermont Environmental Research Associates, proposed placing a string of between sixteen to 24 wind turbines along three miles of the ridgeline on Lowell Mountain, in the town of Lowell, Vermont. The proposed location is close to existing power lines and electrical substations, which would reduce the amount of construction necessary to connect the project effectively to the power grid. Although the physical plant of the wind turbine complex would be completely within the borders of Lowell, it would be visible in the viewsheds of the neighboring towns of Albany and Craftsbury. In early 2009, GMP representatives met with the Lowell selectboard and informed the board that GMP was proposing to build the wind power project, but that GMP would not continue planning without local support. The selectboard informed GMP that it would want the Lowell residents to vote on whether to host the project. KCW invested heavily in public relations, hiring a Lowell couple, Mr. and Mrs. Tetreault, to set up an office in their home to provide information to

252. Id.
253. Id.
255. Id.
256. Id. at 2, 4.
residents on behalf of the proposed project.\footnote{257. G\textsc{reen} M\textsc{ountain} P\textsc{ower}, KCW - Q\&A 11-23, 4 available at www.kingdomcommunitywind.com/filemanager/download/16775 (last visited June 16, 2012).} The Tetreaults and KCW representatives also began making presentations to different groups of townspeople on different aspects of the project.\footnote{258. Interview with Robert Dostis, Vice President GMP (Mar. 23, 2011); KCW - Q\&A 11-23, supra note 247, at 4.} As the KCW information campaign proceeded, certain opponents of the project organized into a non-profit entity called the Lowell Mountain Group.\footnote{259. Robin Smith, Green Light For Lowell Wind Project, NATIONAL W\textsc{ind} W\textsc{atch} (June 3, 2011), http://www.wind-watch.org/news/2011/06/03/green-light-for-lowell-wind-project/.} Although the Lowell Mountain Group’s activities were noted on several websites of other commercial wind project opponents, unlike KCW, it did not establish a comprehensive web site to publicize its positions and archive information.\footnote{260. See K\textsc{ingdom} C\textsc{ommunity} W\textsc{ind}, http://kingdomcommunitywind.com/, (last visited June 16, 2012).}

In its 2009 petition to the PSB to erect meteorological towers to measure wind speeds on Lowell Mountain, KCW included as pre-filed testimony a letter of support from the Lowell selectmen.\footnote{261. Letter from Richard Pion, Alden Warner & Dwight Richardson, Town of Lowell Selectmen, to Trip Wileman, KCW (Jan. 20, 2009), available at http://www.kingdomcommunitywind.com/filemanager/filedownload/phpWrEki/12.%20Lowell%20Letter%20of%20Support.pdf.} The Lowell selectboard reviewed arrangements other towns involved in wind power projects had with their respective developers, and then it began negotiating with GMP. In these negotiations, KCW offered financial incentives above the property taxes that would ordinarily be paid on the project as compensation for hosting the project in Lowell. Over the expected useful life of the project these payments to Lowell could total between $13 million and $15 million, and the property taxes themselves would provide approximately 45% of the annual town budget.\footnote{262. Pion Testimony, supra note 244, at 3–4. The agreement also provided confidence building measures for the town, including a commit to repair town infrastructure damaged during the construction, prior approval of construction plans, a liability insurance policy, a communications protocol, and a decommissioning plan. Id. at 4–7.}

KCW conducted an informational meeting in the Lowell school gymnasium in early November 2009 to give residents an opportunity to ask questions and provide their opinions on the project.\footnote{263. E-mail from Dorothy Schnure, Manager, Corporate Communications, GMP (May 27, 2011, 11:31 AM) [hereinafter Schnure e-mail] (on file with the author); VT. PUB. SERV. BD., NOTICE OF HEARING (Oct. 15, 2009) www.kingdomcommunitywind.com/filemanager/download/16772.} In December 2009 and early February 2010, KCW followed this with two bus tours to a wind
power station in New Hampshire for town residents. The selectboard voted to support the project on February 25, 2010. Prior to the scheduled town meeting day vote, KCW representatives went door-to-door in Lowell distributing information on the proposed project. On town meeting day, March 2, 2010, the measure to approve the project was put to the residents, and they voted seventy-five percent in favor of the project. The meeting was very well attended, and 78% of the townspeople voted. The town selectboard signed the agreement on April 13, 2010. KCW held a barbecue at the Lowell school on June 19, 2010, and provided information on the project to attendees. GMP filed its petition requesting a certificate of public good on May 21, 2010, and after a prehearing conference on July 7, 2010, the PSB set the schedule for the docket, which included a site visit to the project area and two weeks of technical hearings to be held in February 2011. Pursuant to GMP’s request, a workshop conducted by PSB personnel was held for the public on July 23, 2010, at which GMP presented the information that it intended to include in its pre-filed testimony and many of its witnesses who would be submitting testimony. On September 23, 2010, the PSB conducted a site visit and held a public hearing at the Lowell school.

265. Schnure e-mail, supra note 253.
266. Id.
267. Pion testimony, supra note 244.
268. Id.
269. Id.
270. Schnure e-mail, supra note 253.
272. Lowell, supra note 45, at 7; see id. (conducting two additional site visits to view the proposed project from areas that were not able to be incorporated into the initial site visit).
274. Lowell, supra note 45, at 6; KINGDOM COMMUNITY WIND, SECTION 248 WORKSHOP (2010), available at http://usmfiles.s3.amazonaws.com/phpalgz3R/Kingdom%20Community%20Wind%20-%20PSB%20Workshop%20-%2007-23-2010.pdf. “The workshop was designed to provide an opportunity for participants to obtain technical information from the Petitioners in order to better understand the proposed project prior to beginning the discovery phase of the proceeding.” Lowell, supra note 45, at 6.
275. Schnure e-mail, supra note 253.
B. Pre-filed Testimony

Prior to submitting its pre-filed testimony on May 21, 2010, GMP had been working with the ANR on different environmental issues, and had concluded a memorandum of agreement with the ANR on the protocol to be used in assessing bird and bat mortality from the proposed project. However, it had not been able to obtain ANR agreement regarding measures to mitigate the impact on terrestrial wildlife, especially black bears, or on a satisfactory decommissioning plan. The pre-filed testimony of one ANR witness criticized his agency’s acceptance of a portion of GMP’s study plan for impact on bear habitat, and recommended expanding the study area. This same witness identified habitat fragmentation through the construction of the string of towers along the ridge as perhaps the most significant issue for wildlife. Another ANR witness provided pre-filed testimony that he was unable to assess the impact to the public investment in the state’s Wild Branch Wildlife Management Area (WMA). The testimony of a third ANR scientist assessed that the project would have an undue adverse impact through fragmentation and directly upon two important types of uncommon natural communities on Lowell Mountain, unless sufficient mitigation measures were emplaced.

The pre-filed testimony of one DPS witness found that the project would be of economic benefit because of job creation, additional tax revenue, lease payments, and the good neighbor payments GMP had offered to towns bordering Lowell to offset the impacts to their viewsheds.

277. Id. at 13, 25.
278. Id. at 11.
279. Id.
280. Id. at 21.
Further, even though there might be some decrease in the property values of parcels abutting the project, the possibility of a town- or county-wide decrease in property values was unlikely. Finally, even if there were some decrease in property value with a corresponding decrease in tax revenues, the overall economic benefit would still be greater. The pre-filed testimony of a third witness found that so long as noise from the turbines did not exceed the World Health Organization’s standard of 40 dB(A), there would be no adverse impact to the health of those living near the turbines. However, the DPS witness who addressed aesthetics concluded that the adverse impact to aesthetics would be undue, given the potentially large size of the viewshed within ten miles of the project. The witness conducted his own Quechee analysis, noting that “each subviewshed is unique in its own terrain characteristics, natural vegetation patterns and built forms” and therefore undue adverse impact varies depending on perspective. On the west side of the mountain, because of its “working” nature, the project was more contextually compatible. The impact of the turbine string on portions of the view from the largely untouched east side, however, would be “offensive,” particularly with the nighttime lighting required by the Federal Aviation Administration, unless the lighting was mitigated. Accordingly, a fourth DPS witness concluded that irrespective of the economic benefit, GMP’s need for power, and the state’s policy of encouraging renewable energy sources, the project was not in the general public good. This finding was made because of the project’s undue adverse aesthetic impact and GMP’s failure to consider other potentially less costly alternatives to the proposed transmission line upgrade.

284. Id. at 6.
285. Id. at 10.
288. Id. at 10.
289. Id. at 11.
290. Id.
C. Developer Rebuttal

Addressing the concerns raised by the different agencies’ pre-filed testimonies and non-agency interveners, GMP submitted extensive rebuttal testimony a month later. GMP proposed that it would conserve 580 acres of nearby land to mitigate the project’s adverse effects during the life of the project, and of that amount would conserve 180 acres in perpetuity. GMP also proposed modifications to its construction plan that would reduce the amount of forest that was cut to 151 acres, with a directly disturbed area of 124 acres. GMP’s sound expert clarified that there was little health risk associated with sound lower than 45 dB(A), and that although some people were more sensitive to low frequency or infrasound than the average person, there was no evidence of adverse physiological impacts. The majority of GMP’s rebuttal testimony took issue with the agency assessments of habitat fragmentation and aesthetics. GMP quantified the amount of wetland that would be directly impacted by the project at half an acre, and proposed to include wetlands in its 580-acre offset, including approximately 17 acres of good quality wetlands. This was over twice the U.S. Army Corps of Engineers’ recommended offset ratio of 15:1. GMP contested the ANR’s definition of fragmentation, and the degree of adverse effect that a project such as this would have functionally in terms of fragmenting the habitat and impeding animal movement. GMP sharply questioned the empirical basis for DPS’s conclusion that there would be an undue adverse aesthetic impact, arguing that the agency witnesses’ “conclusions are based on the views from a very small portion of the viewshed.” The small number of people who would experience these views tended to do so from the mobile perspective of using certain roads.


296. Id. at 15.


There were only three homes within one mile that would have this view on the east side of the mountain, and the mobile users, although they might include cross-country skiers and snowshoers, also included snowmobilers, whose experience of the view was unlikely to be degraded by looking at the turbines.  

D. Agency Surrebuttal

The ANR’s surrebuttal responses were filed two months later. It was extensive and responded to the GMP rebuttal testimony in detail, explaining why aspects of GMP’s proposed land offset to mitigate the impact of the project was insufficient, and citing scientific studies and articles to refute those proffered by GMP. The ANR surrebuttal offers useful insights into agency philosophy and doctrine. For example, regarding the parcel at issue in the public investment discussion, the Wild Branch WMA, the ANR argued that its forest cutting in that area was not fragmentation because, unlike the cutting that would occur for the project, it would grow back quickly as part of the ever-changing forest. According to the definition of fragmentation used by another ANR witness, however, even this gentler cutting would constitute “fragmentation.” Further regarding the Wild Branch WMA, an ANR witness noted that only foot traffic was allowed in the area, and moving by foot would take users to vantage points “where the profound human influence of industrial turbine presence will significantly alter the remote outdoor experience.” This alteration would begin among users as they were driving to the site, “because everyone approaching the WMA from the north will see and hear the turbines for some distance.” Stated plainly, the state’s public investment in the WMA apparently

299. Id. at 2–3, 6. Mr. Raphael also contested the agency’s assessment of the size of the functional viewshed, as compared to a theoretical viewshed as set out in the agency’s testimony. Id. at 8–9.


303. Id.
includes a pristine aesthetic experience for hunters who have driven there to hunt game.\textsuperscript{304}

The ANR surrebuttal testimony is also worth reviewing because it shows the developer and the agency awkwardly negotiating through testimonial filings. GMP’s rebuttal offered a certain amount of offset acreage. However, the ANR’s wildlife expert set out his conditions for finding no undue adverse impact explicitly as well, including permanent conservation easements for adjacent land parcels, permanent easements to conserve high altitude forest and disturbed ridgeline, connectivity easements with large habitat blocks to the south of the project, and restoration of the project site after decommissioning without possibility of future development.\textsuperscript{305} These conditions later became the basis for a second agreement between the ANR and GMP,\textsuperscript{306} which was concluded on February 23, 2011, and was entered into evidence in the technical hearings the next day.\textsuperscript{307}

\textbf{E. Technical Hearings}

If media reports from the technical hearings are an accurate reflection of the general course of the hearings, in view of the extensive pre-filed testimony, there do not appear to have been many surprises in the witnesses’ live testimony.\textsuperscript{308} Accounts of the hearings suggest they were conducted by the PSB in a very pragmatic, patient, and business-like way, with occasional admonishments to counsel to keep their questioning civil.\textsuperscript{309} Observations

\textsuperscript{304} See id. ("It is a very one dimensional assumption to view hunting and fishing as being only about the harvesting of animals. Remoteness is a quality that plays a very important role in the hunting, fishing, and viewing experience in Vermont.")

\textsuperscript{305} Sorensen Surrebuttal, \textit{supra} note 292, at 12–13.

\textsuperscript{306} Lowell, \textit{supra} note 45, at 119–23 (quoting Natural Resource MOU, Exhibit GMP-ANR).

\textsuperscript{307} \textit{Id.} at 8.


\textsuperscript{309} Lowell, \textit{supra} note 45, at 119–23 (quoting Natural Resource MOU, Exhibit GMP-ANR).
of the testimony showed that the PSB was not averse to pointing out logic gaps in witnesses’ testimony.\textsuperscript{310} Subsequent to the technical hearings, however, the DPS changed its position on the project very dramatically. Consistent with prior PSB dockets on wind power that balanced undue adverse aesthetic impact against overall societal benefit, the DPS revised its assessment to find the adverse aesthetic impact not undue.\textsuperscript{311} As it stated in its brief to the PSB following the technical hearings, although it would have undue adverse impact “on a small but significant number of people,” the overall societal benefits outweighed the impacts.\textsuperscript{312}

\textbf{F. PSB Findings and Order}

In the PSB’s summary of the public comments, it noted that several comments “focused on GMP’s outreach efforts, and stated that the Lowell citizenry was very well informed, and had open and forthright informational meetings with GMP prior” to the town meeting vote.\textsuperscript{313} The PSB noted that other comments “claimed that the residents of Lowell were misled or were ill-informed when they voted on Town Meeting Day.”\textsuperscript{314} The board also noted the comments it had received concerning the negative impact upon tourism, the environment, natural beauty, and health.\textsuperscript{315} The

\begin{itemize}
\item \textsuperscript{310} Carl Etnier Sound, \textit{supra} note 308. During the technical hearings, the sound expert for the Lowell Mountain Group, a private intervenor opposed to the project, recommended that the sound level be set at 30 dB(A) to avoid adverse health impacts, and that the sound of the turbine was akin to a “bang” in terms of its disruptive nature. Upon questioning by the PSB the witness conceded that 30 dB(A) was the sound level that one would expect in a library, and that people did not appear to have problems falling asleep there. \textit{Id.}
\item \textsuperscript{311} \textit{See Lowell, supra} note 45, at 8 (noting that the agreement between GMP and DPS regarding system stability and reliability, and least-cost transmission alternatives, was entered into evidence in the technical hearings on Feb. 23, 2011).
\item \textsuperscript{313} Lowell, \textit{supra} note 45, at 10.
\item \textsuperscript{314} \textit{Id.} at 12.
\item \textsuperscript{315} \textit{Id.} at 10–12; \textit{see also id.} at 39–40 (noting that despite the significance of tourism to Vermont’s economy, there does not appear to have been any empirical assessment done of the project’s impact by either agencies or private interveners). Two neighboring towns argued GMP’s economic analysis was flawed because it did not account for any impact on tourism but their brief provides only general characterizations of the tourist industry in the area and little empirical data. Proposed Findings of Fact and the Brief of the Towns of Craftsbury and Albany, Vermont at 84–87, Docket No. 7628 (Vt. Pub. Serv. Bd. Mar. 21, 2011), http://psb.vermont.gov/sites/psb/files/docket/7628LowellWind/2011-3-21_ALB-CFT_Brief_7628_.pdf. The towns could only afford a landscape expert to challenge GMP’s aesthetic expert on the degree of visibility of the project from surrounding towns; they could not afford analysis to challenge GMP’s assessment that the project was in conformance with the Quechee Test or the impact of the project on tourism. \textit{Page, supra} note 89. Opponents of the Sheffield project, however, estimate that they had spent almost $1,000,000 in opposing the project. \textit{See id.} (explaining the financial
PSB approved the issuance of a certificate of public good on the basis of the project being a non-emitting source of renewable energy that would help meet “the need for renewable energy in the region and aid in achieving the standards of the [RGGI],”316 promote Vermont’s goals under SPEED in the development of renewable energy sources, and provide economic benefit “in the form of jobs and tax revenues.”317 Lastly, because the project will be utility-owned rather than investor-owned, “it will provide GMP and VEC with a long-term source of stably priced power.”318 The PSB conditioned its approval on GMP’s compliance with the agreement it had entered into with the ANR regarding environmental impact mitigation. Specifically, GMP agreed to “ensur[e] there is a sufficient fund to properly decommission” the facility,319 and comply “with noise levels consistent with [WHO] and Environmental Protection Agency . . . guidelines” in limiting noise at homes near the facility.320

1. Public Health

Sound had been an important issue throughout the proposal and the proceedings, and the PSB recognized that “[n]oise from the proposed project will likely be audible at residences surrounding the proposed project.”321 After receiving extensive testimony on both the nature of the sound generated by the turbines and the appropriate sound level to be met at the nearby residences to ensure no adverse impact upon health, the PSB confirmed the standard used in previous wind power dockets: 45 dB(A) at the outside of homes. The PSB also characterized the turbine sound as a “swish”322 rather than a “bang” as described by a sound expert for a private intervener.323 The PSB did find merit in the intervener’s concern that the project would essentially use their property between the project and the

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317. Lowell, supra note 45, at 10.


319. Id. The PSB characterized this as a matter of “inter-generational equity.” Id. at 5.

320. Id. at 5.

321. Id. at 98.

322. Id. at 93.

323. Carl Etnier, supra note 302.
residences as a noise buffer. It distinguished a Vermont Supreme Court case that had held that the section 248 process was not required to consider individual property rights in determining whether to issue a certificate of public good, finding that in this docket, it was considering “a project that could entirely preclude certain development on neighboring properties for which there would not be the possibility of compensation in a subsequent condemnation proceeding.” Accordingly, it conditioned the certificate of public good upon GMP (1) meeting specific noise standards both on the exterior and interior of existing residences, and (2) developing a plan, prior to project operation, to “provide some form of compensation to adjoining landowners who can demonstrate that residential development of their land which otherwise could have occurred, can no longer happen solely because project-related sound levels at new residences on those parcels or subdividable portions thereof would exceed” the specified noise levels.

As to health and public safety, the PSB found no issue regarding ice throw, structure failure, flicker, or construction blasting, so long as certain operating conditions were met.

2. Economic and Societal Benefit

As to the general good of the state, the PSB noted that “[i]n prior cases involving wind generation facilities that were being proposed by non-utility merchant generators, we found the projects would not provide sufficient benefit to the . . . state absent the developers entering into stably priced power purchase agreements with Vermont utilities for a substantial portion of the projects’ output.” The PSB found that the project would “contribute to diversification of the state’s energy portfolio, reduction in global climate change caused by CO2 emissions, and protection of air quality” and “would also result in long-term stably priced power resources for the regulated utility,” thereby resulting in “the economic benefits associated with the development of renewable projects, consistent with the state policy goals.” In so doing, the PSB rejected the intervener’s

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325. Id. at 101–02. In a concurring opinion, the PSB Chairman dissented from this portion of the PSB decision on grounds that the PSB had exceeded its statutory authority. Id. at 168. He did recommend that GMP consider voluntarily making a plan that would compensate adjoining landowners if noise became an issue in the development of their property. Id. at 169.
326. Id. at 46–49.
327. Id. at 140.
328. Id. at 141–42.
arguments that GMP’s witness had miscalculated the cost of power from the project, noting that the argument appeared to be based on an incomplete reading of the record evidence, and that the intervener had chosen not to conduct discovery, present its own witness, or cross-examine GMP’s witnesses at the hearings.\textsuperscript{329} As to economic benefit, the PSB found that “[s]ection 248 only requires a project to have a net economic benefit” and “does not prohibit projects if there are some negative economic impacts, provided those impacts are outweighed by positive impacts so that the net result is economic gain.”\textsuperscript{330} Specifically, with regard to tourism, the PSB concluded the evidence before it showed “that there will not be a negative impact on tourism” because of the project, and in fact, it might even serve as a tourist draw.\textsuperscript{331} GMP also made offers of what it termed “good neighbor payments” to towns adjoining Lowell that would not be hosting the project but would still have the project in their respective viewsheds.\textsuperscript{332}

3. Wildlife and Wildlife Habitat

Because the two state-significant natural communities on Lowell Mountain that would be affected by the project were “uncommon” rather than “rare,” the PSB was not required to issue a finding of no undue adverse impact upon them.\textsuperscript{333} However, the PSB also found that the mitigation and decommissioning measures in the ANR-GMP agreement relating to wildlife habitat and endangered species would mitigate any impact to a level of being only adverse, rather than unduly adverse.\textsuperscript{334}

As to wildlife and habitat, the PSB likewise found that the project would “not destroy or significantly imperil necessary wildlife habitat,”\textsuperscript{335} although it would “still have an adverse effect on natural communities and the natural environment” despite the measures in the ANR-GMP agreement.\textsuperscript{336} The agreement focuses primarily on the main issues identified in the ANR’s pre-filed testimony: the loss of bear habitat specifically, and habitat fragmentation generally. In total, under the agreement, 292 adjacent acres would be conserved for bear habitat for twenty-five years after the

\textsuperscript{329}. Findings & Order, \textit{supra} note 310, at 142–43.
\textsuperscript{330}. \textit{Id.} at 39–40.
\textsuperscript{331}. \textit{Id.} at 40.
\textsuperscript{332}. \textit{Id.} at 13. The Good Neighbor Fund requires a minimum per year payment of $10,000. \textit{Id.} at 23.
\textsuperscript{333}. \textit{Id.} at 115.
\textsuperscript{334}. \textit{Id.}
\textsuperscript{335}. Findings & Order, \textit{supra} note 310, at 116.
\textsuperscript{336}. \textit{Id.} at 117.
completion of decommissioning and 110.3 acres would be subjected to a permanent conservation easement.\footnote{337} To mitigate habitat fragmentation, 324 acres of ridgeline would be permanently excluded from development other than for a subsequent renewable energy project, and GMP would be required to obtain, prior to commercial operation, “prudent conservation easements of adequate size and location, as approved by ANR, to be held in perpetuity, to provide wildlife habitat connectivity.”\footnote{338}

The PSB did not find water and soil pollution to be an issue because GMP had provided evidence that showed it would meet the applicable standards required for permitting.\footnote{339} On the related issue of wetlands, the PSB noted that it must give due consideration to the criteria set out in title 10, section 6086(a)(1)(G) of the Vermont Statutes, which requires that proposed developments comply with Vermont’s rules on significant wetlands. Accordingly, the PSB conditioned the grant of the certificate of public good upon GMP providing a mitigation plan for the project’s adverse impacts to high elevation wetlands, “in particular their headwaters function,” as required under the Vermont rules.\footnote{340} This plan is in addition to the section 401 certification, the section 404 permit, and wetlands permits that GMP would need prior to construction.\footnote{341}

In its findings, the PSB found that GMP had selected Lowell Mountain in part because it had “the low potential for environmental or other impacts.”\footnote{342}

4. Aesthetics

The PSB also found that the project would “not have an undue adverse impact on the scenic and natural beauty of the area or aesthetics.”\footnote{343} In the section 248 process, the PSB’s use of the Quechee test is “significantly informed by the overall societal benefits of the project.”\footnote{344} The PSB rejected the arguments of private interveners that its consideration of societal benefit in the evaluation of whether there was undue adverse

impact was impermissible under section 248.\textsuperscript{345} Two things are important in the PSB’s analysis in this section. The first is the flexible and pragmatic way in which the PSB assessed the affected viewshed.\textsuperscript{346} The second is the PSB’s implicit recognition that not only do visually mitigating measures such as lowering the height of the turbines begin to significantly degrade the efficiency of the project, but also that adjusting the location of the turbines would cause greater adverse impact on wildlife, thereby nullifying the aesthetic benefit.\textsuperscript{347}

5. Public Support

As to the section 248 criteria, the PSB found that there would not be undue interference with the orderly development of the area, given the substantial amount of rural area that would be unaffected by the project, and the lack of prohibition in any regional or municipal plan regarding wind power development.\textsuperscript{348}

The PSB found the “project would not unnecessarily or unreasonably endanger the public or quasi-public investment in public facilities,” nor would it “materially jeopardize or interfere with the function, efficiency, or safety of, or the public’s use or enjoyment of, or access to, the public facility, service, or lands.”\textsuperscript{349} The PSB found that, although there would be an adverse impact on the trails to some degree, the lengths of impacted trail were small, and in some cases were already experiencing dual use with snowmobiles.\textsuperscript{350} As to the Wild Branch WMA, the PSB noted that those using it could still freely access it and use it as they had in the past, “[a]lthough some may perceive their experience to be somewhat less remote in character,”\textsuperscript{351} apparently not accepting the ANR’s characterization of the essence of the users’ experiences.

GMP had proposed to use accumulated depreciation to fund decommissioning, and to meet the terms of the agreement with the ANR,

\textsuperscript{345} Id. at 89. The PSB likewise rejected an intervenor’s argument that the § 248 process was unconstitutional because the PSB exercised both administrative and legislative powers, noting that the Vermont Supreme Court had held that the PSB is without authority to address constitutional issues. Id. at 155–56.

\textsuperscript{346} Id.

\textsuperscript{347} Findings & Order, supra note 305, at 87.

\textsuperscript{348} Id. at 25. The PSB did not explicitly base its determination on orderly development upon DPS’s argument that the project should be seen as consistent with the Lowell town plan because the town voted in favor of the project, but did note it in its findings. Id. at 24.

\textsuperscript{349} Id. at 134.

\textsuperscript{350} Id. at 135.

\textsuperscript{351} Id.
which would amount to approximately $5,381,000 over the projected 25-year life span of the project. To ensure that there would be sufficient funds at the time of decommissioning, the PSB directed GMP to file a plan prior to construction that incorporated the requirements of the ANR agreement and provided a detailed cost estimate of decommissioning. As to the fund itself, the projected salvage value of the project could not be deducted from it; to ensure the fund’s availability at the time of decommissioning, GMP would be allowed to obtain a letter of credit naming the PSB as the beneficiary and would be required to “demonstrate that the fund will be managed independently and be creditor and bankruptcy remote in the event of GMP’s insolvency or business failure.” If GMP wished, it could still establish a separate fund in which to place the accumulated depreciation charges, also creditor and bankruptcy remote, which it could use to reduce like amounts on the letter of credit over time.

G. Summary

GMP did a significant amount of field research before deciding to pick Lowell Mountain as the site for a wind power facility, which the PSB noted in terms of GMP’s seeking to minimize environmental impact. GMP’s early and continuing outreach efforts in Lowell to inform the public of its plans, coupled with its financial offers to the town, appear to have been key in securing the residents’ approval to build the project during the course of the annual town meeting. Although the PSB appears to carefully avoid suggesting it would still issue a certificate to a wind power facility for the public good even if a town really did not want to host the facility, town approval may very well be an unspoken equitable factor in the PSB’s decision-making process. Explicitly, the value of the town decision in this docket was that it helped quantify the economic benefit of the project in the PSB’s assessment of whether societal benefit outweighed any undue adverse environmental impact. Further, GMP’s study of past dockets led it to put significant effort into providing very thorough pre-filed testimony, which it had the opportunity to field test at the workshop held in July 2010.

352. Id. at 147.
353. Findings & Order, supra note 310, at 150.
354. Id. at 151.
355. One writer suggests that the way to overcome local resistance is to spread the economic benefit to more than just the actual landowner, that is, to pay those affected in other ways for the loss of something they value, such as aesthetics. Susan Lorde Martin, Wind Farms and NIMBYs: Generating Conflict, Reducing Litigation, 20 FORDHAM ENVTL. L. REV. 427, 464–65 (2010).
Although the PSB clearly conducted its own evaluation of GMP’s empirical methodologies, the findings it adopted in the docket rarely disputed the information provided by GMP. Finally, while GMP representatives evidenced frustration at times during their negotiations with the ANR, being able to present the PSB with agreements detailing how GMP would meet the agency’s concerns regarding wildlife, habitat, habitat fragmentation, and decommissioning appears to have been very significant for the PSB. Accordingly, the Lowell Mountain docket process clarifies for potential developers the scope of the preparatory and testimonial work needed to bring a wind power project to the PSB with a reasonable expectation of success, and provides a more accurate picture of additional costs associated with mitigation measures that would likely be necessary to address environmental concerns.356

CONCLUSION

A number of writers have proposed possible solutions to wind power siting issues. Some have suggested that the basic assumption that wind turbines have an adverse impact needs to be revisited. They point out that if the “undue adverse impact” criterion had been applicable earlier, then:

Every human intrusion on the Vermont landscape that we now revere as emblematic of our rich cultural heritage, from monitor barns to New England connected farmhouses to church steeples to the very cow pastures we regard as quintessentially natural, might never have been allowed under a regulatory regime that precludes projects solely based on ‘undue adverse impact’ as that phrase has been interpreted in . . . section 248.357

356. Opponents of the Lowell Mountain project appealed the PSB’s grant of a Certificate of Public Good to the Vermont Supreme Court, which heard argument on the case on March 28, 2012. Jody M. Prescott, Author’s Notes (March 28, 2012) (on file with author). Among other points, Appellants’ argued that fairly minor technical issues invalidated the certificate, such as: the PSB lacking the expertise necessary to issue findings on issues of habitat fragmentation, the PSB basing its decision on evidence that the project had to be complete by a certain time to qualify for certain production tax credits, delays were fatal to the grant of the certificate, and the PSB had failed to consider certain data with regard to wind turbine noise modeling. Id. Based on the thoroughness of the enquiry in the Lowell Mountain document, and the deference accorded PSB decisions, these arguments will not likely prevail.

357. See Sautter & Kreis, supra note 38, at 48–49 (“[H]ow fortunate if Vermont could avoid [the subjective decision-making required under the Quechee Analysis] by reaching consensus that wind turbines are not out of character with their surroundings and thus have no adverse aesthetic impact.”).
Conceivably, the Vermont General Assembly could legislate this sort of consensus through amending section 248, but the broad impact of such an enactment would essentially vitiate the aesthetics portion of the process, and would not appear to be in keeping with contemporary environmental values of significant numbers of state citizens. Other writers have suggested that one way to harmonize the diverse state and local regulations and requirements in the U.S., such that opposition groups have less impact on siting decisions, is to create an equivalent to the Telecommunications Act of 1996, which “leaves primary siting authority in the hands of local regulators, but places explicit substantive and procedural constraints on the decision-making process.” They suggest that “[g]iven the relative newness of wind energy technology and the vast geographic and demographic variations amongst wind-rich communities, Congress should avoid adopting a substantive ceiling on wind energy facilities siting.”

They also suggest that “[a] federal wind siting statute could, similarly, preempt local regulations that exclude, or have the effect of excluding, wind energy facilities from a jurisdiction with wind energy potential.” Such an approach, however, would ignore the very significant differences between the environmental impacts of communications towers and lengthy strings of wind turbines on ridgelines, and, even though it could probably be justified under the Commerce Clause, it would represent a major shift in the relationships between the federal government and the states in an area perhaps left more properly to the states under the Tenth Amendment.

There are a number of factors that have influenced the development of commercial wind energy generating facilities in Vermont. The origins of some of these factors lie outside Vermont, such as the recent financial crisis that eliminated the possibility of borrowed capital to continue the Grandpa’s Knob project, and whether federal tax credits will continue to be available for wind energy developers. A number of these factors are tied,

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359. Id. at 1092–93.
360. Id. at 1093.
directly or indirectly, to the significance of ridgelines under Vermont’s strong environmental laws, and the important environmental values that these laws protect. Further, the deliberative mechanisms that effectuate these laws, such as the section 248 process, are impacted both legally and politically by Vermont’s system of participatory democracy at the town level. In this context, the fact that the most efficient wind energy systems would need to be built on ridgelines at altitude means that the aesthetic environmental requirements of Vermont law will likely always be implicated. Simply by virtue of topography, these sites may implicate sensitive biomes and species. Further, topography also suggests that these sites will likely be located in towns with low population densities. In keeping with Vermont’s patterns of participatory democracy, these towns are more likely to have greater attendance at their town meetings, and the very personal impacts of these power systems on individuals would tend to accentuate that trend. Although town decisions on whether to allow the construction of wind energy power systems are not binding upon the PSB as a matter of law, the degree of local political support is important to wind power developers. In particular, local political support can indicate the degree to which interest groups might seek to intervene in PSB hearings or seek appeal to the Vermont Supreme Court, and weighs favorably on behalf of the developer in PSB considerations of orderly development, economic benefit and societal good.

The section 248 process provides a basic holistic approach through the breadth of the enquiry before the PSB mandated by the statutory criteria. The advocacy roles of the ANR and the DPS, coupled with measures that enhance the transparency of the process, such as the workshops and public meetings provided for under the PSB rules, provide a tremendous amount of information from various perspectives for the PSB to consider in its deliberations. The opportunities for rebuttal and cross-examination expose different perspectives and data to serious critical evaluation, thereby enhancing the quality of the deliberative process. Further, the PSB’s application of the different balancing tests that it has developed, such as offsetting adverse aesthetic impact with societal benefit to determine whether the adverse aesthetic impact is undue, provide a weighing of different criteria that help reconcile positive competing environmental interests. As shown by the Lowell Mountain case study, the section 248

credits, and loan guarantees in boosting renewable energy development); see also Etherington, supra note 164, at 83 (explaining the many different subsidies provided to wind power to make it attractive to developers).
process is not an obstacle for developers who study and appreciate its workings and evidentiary rigor. Also, the resolution of the competing approaches to quantifying the intangible criterion of aesthetic impact in the Lowell Mountain docket provides a rational approach to more accurately gauge the actual impact of a project on aesthetics to both opponents and supporters of wind energy projects. Additionally, the section 248 process provides the necessary empiricism to keep the enquiry from being too subjective. Other examples of state energy facility siting processes may encompass many of the same aspects required to be reviewed under the section 248 process. One such example is New Hampshire’s Siting Evaluation Committee process, but it does not deal with the review criteria with the same systemic rigor as the section 248 process.

Therefore, the section 248 process not only buttresses Vermont’s well-deserved reputation for conservation and practical sustainability, it potentially serves as a model for forging the sustainability that the National Strategic Narrative seeks to promote to the international community.


WATER POLLUTION IN THE GREEN MOUNTAIN STATE: A CASE STUDY OF LAW, SCIENCE, AND CULTURE IN THE MANAGEMENT OF PUBLIC WATER RESOURCES

Daniel D. Dutcher* and David J. Blythe**

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INTRODUCTION

By the end of the last century, Vermont had earned a national reputation as a leader in environmental protection. For example, Vermont was the first state in the nation to pass a bottle deposit/redemption bill and the first to ban billboards. In 1970, Vermont led the nation in statewide land use planning and control by enacting Act 250, the state’s landmark regulatory program for reviewing and controlling large scale and environmentally-sensitive development. Act 250 utilizes state law implemented by local citizen boards. These legislative efforts took vision and leadership, and came about only after hard-fought political battles and inspired consensus-building.

The fact that Vermont has managed to enhance and preserve the quality of its natural environment throughout the 20th century is only partly the result of these and other community-minded innovations. An entirely different, but no less significant, explanation may be that Vermont virtually missed the industrial revolution, which propelled much of America into unplanned development and widespread environmental degradation. Compared to many other states, Vermont is cold, mountainous, remote, and, hence, sparsely populated. In *The Vermont Owner’s Manual*, Frank Bryan and Bill Mares write that Vermont got so far behind the rest of the country

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4. In the first years after Act 250 took effect, it received widespread acclaim. In a retrospective assessment of the law’s early impact, Governor Thomas Salmon (1973-1977) wrote:

Act 250 was an idea whose time had come. It represented an intuitive, bipartisan, Vermont response by our then-Governor Deane C. Davis, to a clear and present danger. . . . History records that the most significant period of economic growth in Vermont has occurred following enactment of this visionary statute, which insists that Vermont will employ value-driven criteria as the basis for development decisions. It has tempered how we have grown in a manner that helps make this state the special world that it is.

that it’s been lapped and now finds itself ahead. In the 1960s and 1970s, Vermont became a mecca in the back-to-the-land movement, and Vermont’s green brand now supports the tourism that keeps the state’s economy afloat. In 2004, National Geographic Magazine named Vermont one of the world’s best unspoiled destinations.

But Vermont’s place at the head of the environmental class may be at risk. Also in 2004, the National Trust for Historic Preservation placed Vermont on its list of significantly endangered historic places in America. Due in substantial part to the completion in the 1970s of two major interstate highways—I-89 and I-91—Vermont has lost its historic isolation and now increasingly finds itself subjected to the same kinds of environmental pressures as more populated and industrialized states. Nowhere is this pressure felt more keenly than in the efforts to preserve the quality of Vermont’s surface waters—its signature lakes, rivers, and streams.

Over the last several years, water pollution in Vermont has become a regular news story. Phosphorus pollution earned Lake Champlain a place in Peter Greenberg’s 2009 book, Don’t Go There!: The Travel Detective’s Essential Guide to the Must-Miss Places of the World. Greenberg was the Travel Editor of the Today Show, and his book has sold over a million copies. In other news, the United States Environmental Protection Agency (EPA) openly criticized the efforts of the Administration of former Governor James Douglas in implementing the Clean Water Act in the state,

8. The condition of Vermont’s natural environment may be coming full circle. Vermont currently absorbs more carbon than it emits because the state is mostly forested, and the state’s electrical supply comes mostly from hydroelectric dams. However, Vermont was mostly denuded of forests in the early 1800s for sheep pasture. The forests recovered only after sheep farming in Vermont was no longer profitable. Vermont, both past and present, like virtually everywhere else, has found protecting the environment against economic pressure to be very challenging. See, e.g., R. STIRMBECK AND N. BAZILCHUK, THE LONGSTREET HIGHROAD GUIDE TO THE VERMONT MOUNTAINS (Taylor Trade Publishing 1999); CHARLES W. JOHNSON, THE NATURE OF VERMONT: INTRODUCTION AND GUIDE TO A NEW ENGLAND ENVIRONMENT (1998).
and with regard to Lake Champlain in particular. The Douglas Administration responded by attacking Greenberg and attacking EPA.

Vermont’s high-profile legislative and courtroom battles over its threatened lakes and streams have begun to tarnish the state’s theme-park image. Resistance on the part of the Vermont Agency of Natural Resources (ANR) to fulfill its responsibilities under both the federal Clean Water Act and Vermont’s Water Pollution Control Act, coupled with opportunistic litigation by environmental advocacy organizations, often followed by sometimes hasty reactive legislation, have confused and further complicated Vermont’s already labyrinthine environmental regulatory programs. ANR’s defenses to a series of successful legal actions brought by environmental advocates occasionally have been characterized by unconvincing interpretations of the law, scientifically dubious rationales, and an apparent lack of resolve to regulate the state’s waters in the face of considerable development pressure and political resistance.

It is fair to observe that Vermont has clearly struggled—with limited governmental resources and in the face of endemic political pressure to foster economic expansion—to cope with the mounting environmental stressors on its public waters. Nevertheless, in the midst of these struggles, Vermont has more than once found itself leading the nation on water pollution regulation. How and why did these novel issues emerge in Vermont rather than some larger, more populated state like Texas, Pennsylvania, or California? The answer lies partly in the fact that, in reality, no state in the nation, and no federal agency for that matter, fully administers or enforces its water pollution control laws. And while Vermont

14. VT. STAT. ANN. tit. 10, § 1250 et seq.
has fallen short of keeping at least some of its surface waters fully protected, its water pollution control programs, by comparison, have often been more effective (or at least, less ineffective) than those of many other states. Further, Vermont appears to have been strategically selected by environmental advocacy organizations to serve as a venue for challenging both federal and state water pollution regulatory programs.

As a result, Vermont represents an interesting and instructive case study of the national struggle over water resource protection. Since the turn of the 21st Century, Vermont has found itself in the forefront of a number of original national legal issues in environmental law and science, with surface water protection foremost among them. Vermont's experience shows how, in many instances, environmental litigation catalyzes environmental cleanup. This experience also shows how all too often stakeholders are not quite prepared to look far enough ahead, work well enough collectively, or take the individual and institutional responsibility needed to deal effectively with water pollution.

Also important, Vermont is home to several committed and creative environmental advocacy organizations, including the Vermont Natural Resources Council (VNRC) and Conservation Law Foundation (CLF). These membership-supported groups have effectively employed actual and threatened litigation, lobbying, technical and legal participation in public debates, and negotiation in their ongoing efforts to compel Vermont to more aggressively follow the law. To the extent these environmental organizations have successfully nudged the state’s cleanup efforts ahead, it appears to have been in part because they have understood and advocated national water pollution control issues in a local context. Further, these organizations have operated in a relatively supportive political climate (at least compared to many other states). Finally, the connection that many Vermonters feel to their public waters has surely contributed to Vermont taking a leading role on many water pollution control issues.

On the other side of the scrimmage line, Vermont also provides a telling example of “agency capture”—how the mission of environmental agencies to some extent has evolved from one of regulating business activity in order to protect the environment to one of insulating businesses from the consequences and costs of environmental regulation.16 The authors readily

16. See Reid Mullen, Note, Statutory Complexity Disguises Agency Capture in Citizens Coal Council v. EPA, 34 ECOL. L. Q. 927, 927 (2007) (commenting on the change made by environmental agencies from protecting the environment to instead protecting businesses from the costs of environmental litigation and fines). See also, e.g., Roy E. Rickson, Dimensions of Environmental Management: Legitimation of Government Regulation by Industrial Managers, 9 ENV’T & BEHAV. 15,
and emphatically acknowledge that ANR is comprised of many talented individuals whose commitment to environmental protection is honest and sincere. But a burning house looks different from the inside than it does from the outside. As commentators, we have the luxury of looking at the burning house from the outside. That having been said, the history of recent water law in Vermont nonetheless serves to illustrate how water pollution regulation is as much a crisis of public policy as it is of anthropogenic impact on the physical environment. It is a story about how government, faced with competing interests, sometimes circumvents or turns a blind eye towards those laws meant to protect public resources for the common good unless and until they are forced—by crisis or litigation, and sometimes reluctantly—into action.

Environmental protection is fundamentally an exercise in balancing competing interests, e.g., protecting natural resources and fostering economic development, while simultaneously maintaining or promoting a characteristic quality of life, which is itself a function of intangible values and traditions that may not always comprise a commonly shared vision, and then implementing regulatory strategies to accommodate those interests. In a capitalist society, those competing interests find life in, and are represented by, the marketplace. Water pollution, like other forms of environmental degradation, ultimately represents a market failure. Even in a relatively small marketplace like Vermont, trying to balance and to contain those competing market forces has proven to be a formidable task. Water resource protection raises complicated questions about the role of government in free society, and tends to amplify the perennial argument over individual prerogatives versus collective responsibility. Vermont’s experience over the last decade illustrates the inherent difficulties, challenges, and opportunities that arise as states struggle to carry forward

30 (1977) (examining why agency regulation of the environment gives economic development priority over environmental quality).

17. The term “balance” has become a conservative buzzword, the idea being that individual prerogatives are balanced against the common good and somehow the interests of the individual invariably prevail. Individualists often want regulatory agencies to balance individual projects against the larger good, even though striking a balance in environmental protection is primarily a legislative function. Regulatory agencies may accommodate pressure by balancing individual projects through their enforcement discretion. Enforcement discretion has traditionally allowed regulatory agencies to prioritize resources and to administer the law justly, but agencies sometimes use enforcement discretion to ignore laws for political purposes. See, e.g., Bryan S. Miller, Note, Harmonizing RCRA’s Enforcement Provisions: RCRA Overfiling in Light of Harmon Industries v. Browner, 5 Envlt. Law. 585, 587–589 (1999).

18. Vermont’s motto is the conundrum, “Freedom and Unity,” VT. STAT. ANN. tit. 11, § 491(2) (2010). Perhaps the motto itself speaks to the nature of political debate from the founding of the nation to the present day.
In recent years, Vermont, along with the rest of the nation, has seen a major shift in the focus of water quality protection from regulating the sources of pollutant discharges to assessing the assimilative capacity of the receiving waters. This newer approach, which frequently utilizes a regulatory tool called the Total Maximum Daily Load (TMDL), requires regulatory agencies to determine the quantitative ability of a receiving water to accept a given pollutant before authorizing a new or increased discharge.\footnote{See, e.g., Oliver A. Houck, The Clean Water Act Returns (Again): Part I, TMDLs and the Chesapeake Bay, 41 ENVTL. L. REP. 10208 (2011), available at http://www.eli.org/pdf/41.10208.pdf (explaining how TMDLs for impaired waterways have been an integral component of the federal Clean Water Act from the get go. However, resource agencies initially focused their attention on technology-based controls rather than ambient-based permitting); Lara D. Guercio, The Struggle Between Man and Nature—Agriculture, Nonpoint Source Pollution, and Clean Water: How to Implement the State of Vermont’s Phosphorus TMDL Within the Lake Champlain Basin, 12 VT. J. ENVTL. L. 455 (2011) (reviewing nonpoint source pollution controls under the Federalist system and outlining how to implement phosphorus TMDLs in Lake Champlain).} Although ambient-based water quality management imposes a substantial burden on both regulatory agencies and the regulated community, it is often the only legally and scientifically defensible approach to determining whether or under what conditions to issue a discharge permit.

This paper offers both a retrospective on and a look forward to some of Vermont’s more salient water pollution control issues in the new millennium. We identify some of Vermont’s failed water pollution control policies as well as some successes, and we offer—both explicitly and implicitly—suggestions for resolving some current water pollution issues. Addressing water pollution is a legally, scientifically, and culturally complicated task, no less so in Vermont than elsewhere. Indeed, the very complexity of the issues makes it that much easier for politicians to talk a greener game than they play and that much harder for the media and the public to fully understand where the truth lies.

I. VERMONT’S WATER POLLUTION PROBLEMS

A. Phosphorus Loading into Lake Champlain

1. Background

Lake Champlain, on the northwestern border of Vermont, is one of the jewels of the state’s natural resources. The lake is 120 miles in length
(north-south) and covers 435 square miles within a drainage basin of 8,234 square miles, 56 percent of which lies in Vermont, 37 percent in New York and 7 percent in Quebec.\textsuperscript{20} It holds approximately 6.8 trillion gallons of fresh water and has 587 miles of shoreline.\textsuperscript{21} The lake can be divided into five distinct geomorphic regions (the South Lake, the Main (or Broad) Lake, Mallett’s Bay, the Inland Sea (or Northeast Arm) and Mississquoi Bay), each with different physical characteristics.\textsuperscript{22} The lake consists of thirteen segments for purposes of water quality standards, which establish the requirements for ambient water quality under federal and state law.\textsuperscript{23}

Approximately 571,000 people live in the drainage basin, and roughly 200,000 people depend upon the lake for their drinking water.\textsuperscript{24} 99 public water systems draw water from Lake Champlain, and an estimated 4,149 persons take their drinking water directly from the lake.\textsuperscript{25}

Lake Champlain faces a number of threats, including mercury pollution, exotic and invasive species, and eutrophication from excess phosphorous.\textsuperscript{26} Mercury pollution in Lake Champlain is largely the result of atmospheric deposition (via rain and particulate fallout) from sources upwind of Vermont and demands national and even international efforts in air pollution control. Exotic and invasive species, which by definition come from far and wide, present long-term challenges in lake management. And while atmospheric deposition contributes to the phosphorous load in Lake Champlain, eutrophication of the lake is mostly the result of regional and local water pollution and can only be effectively addressed through the combined water pollution control efforts of Vermont, New York, and Quebec.

Only a small part of Quebec drains into Lake Champlain, and much of the drainage from New York comes from undeveloped regions of the Adirondack Park. In stark contrast, Vermont’s sewage treatment plants, industrial sites, parking lots, streets, ski resorts, and farms discharge the majority of water-borne phosphorous into Lake Champlain. Accordingly,

\begin{itemize}
\item \textsuperscript{21} Id.
\item \textsuperscript{24} Lake Champlain Basin Program, supra note 23.
\item \textsuperscript{25} Id.
\item \textsuperscript{26} See generally Mark Malchoff & Susan Trzaskos, Lake Champlain Fisheries Habitat—A Primer for Lake Champlain Stakeholders (2006).
\end{itemize}
Vermont has accepted the lion’s share of responsibility for cleanup. To date, however, the efforts of Vermont’s executive agencies to curb the introduction of phosphorous loads into Lake Champlain have fallen well short of their responsibilities to the public trust.

2. Eutrophication Due to Phosphorus

Eutrophication is a process by which a body of water becomes enriched with dissolved nutrients. These nutrients feed algae, which then deplete the water of dissolved oxygen through nighttime respiration and microbiologically mediated decay. A plant population is limited in its growth by the nutrient in shortest supply, just as a chemical reaction is limited by the chemical that runs out first—the limiting reagent. In the natural state, the nutrient in shortest supply and in greatest demand in many river and lake systems, including Lake Champlain, is phosphorous. Thus, adding phosphorous to the lake feeds a biochemical reaction that causes the algae population—which always lives on the edge of starvation—to grow.

Like other plants, algae produce oxygen through photosynthesis during the daytime. At nighttime, however, plants consume oxygen through respiration. Dying algae feed microbes, which also demand dissolved oxygen. Water holds more dissolved oxygen in cooler temperatures. Thus, fish-kills due to lack of available oxygen in eutrophic waters tend to happen on warm summer nights. Although eutrophic lakes are sometimes called “dead” lakes, they are, in fact, super alive—the problem is that the dominant life form is nuisance algae. In addition to producing algae, phosphorous pollution also feeds photosynthetic cyanobacteria, which used to be called blue-green algae. Some forms of cyanobacteria produce neurotoxins.

Phosphorous pollution in Lake Champlain continues to cause nuisance algae. In recent years, a number of dogs have died as a result of drinking water from parts of the lake that were poisoned by cyanobacteria. Some segments of Lake Champlain fail to meet legal water quality standards due to excess phosphorous. Phosphorous levels in the lake’s 13 segments have

30. In re Montpelier WWTF Discharge Permit, No. 22-2-08, 1, 4, 8 (Vt. Envtl. Ct. 2009), available at
increased or stayed about the same during Governor Douglas’s tenure (2003 to 2011),\textsuperscript{31} in spite of a $100 million investment in cleanup.\textsuperscript{32}

Sources of phosphorous pollution in Lake Champlain include discharges from sewage treatment plants and stormwater runoff, the latter of which carries animal waste and phosphorous-laden sediment into the lake from both developed and agricultural lands, either directly or by way of tributary streams. So much phosphorus has run off the landscapes of Vermont, New York, and Quebec over the years that the lake sediment itself may have become a significant source of phosphorus loading into the lake’s water column.\textsuperscript{33}

\textbf{B. Stormwater Runoff}

Although it may not be immediately obvious to the casual observer or visitor, hundreds of Vermont streams or stream segments are presently polluted.\textsuperscript{34} Vermont streams are impaired by a variety of causes, but there is a general consensus that the most challenging issue facing these steams today is stormwater runoff from both developed lands and farms.

Stormwater causes four distinct problems in terms of surface water quality: (1) transport and deposition of unwanted sediment into receiving waters, (2) streambank scouring and erosion along the transporting stream channels, (3) introduction of thermal pollution (heat) into receiving waters,
and (4) transport and deposition of chemical pollutants—especially phosphorus—into already impaired receiving waters.

Simply stated, stormwater carries polluted water into streams, and the large slugs of water that enter streams from both developed and agricultural settings during rain events scour and erode stream banks and fill stream beds with sediment. Natural forests and wetlands infiltrate rainfall and then gradually discharge cool groundwater into streams, thereby naturally regulating flows and protecting stream habitat. In contrast, runoff from the impervious surfaces in urbanized areas, from ski slopes and parking areas at ski resorts, from golf courses, and from farm fields can make streams flashy, with higher and warmer high flows and lower low flows compared to streams in more natural environments.

Excess stormwater runoff sets into motion a series of interrelated impacts on the streams that serve to collect and transport the runoff. Heated water flowing into streams from developed landscapes lowers dissolved oxygen levels in receiving waters, contributing to the eutrophication of those waters. Exogenous sediment washing into surface waters from surrounding lands and endogenous sediment entrained from scoured streambeds and banks can clog fish gills and bury the gravelly habitats that fish need for breeding and feeding. As high flows during storm events scour out channels, streams are deprived of their natural flood plains. Future storm events then drive streams into even deeper trenches. Rainfall that runs off urbanized and agricultural landscapes fails to recharge groundwater. As unnaturally high flows in stormwater-impaired streams subside after rain events, these streams become desiccated, having been deprived of their base flows by lack of groundwater discharge. The unnatural changes to the shape and structure of streambeds and banks, along with pollutants that wash off the surrounding landscape, destroy the aquatic microinvertebrates that support the aquatic food chain.

During rain events, urbanized and agricultural areas send a witch’s brew of pollutants into streams. These pollutants include agricultural chemicals, metals, pet wastes, litter, and sediments. If not carefully managed, manure and sediment from farms wash into streams. Parking areas, roads, and roofs at ski resorts and golf courses produce runoff that accelerates changes in stream geomorphology. The list goes on.
C. Draining and Filling Wetlands

Protecting wetlands is essential for protecting the waterways to which they are hydrologically connected, and wetlands also merit protection in their own right for the numerous ecological and societal functions and values they serve. The Clean Water Act protects most wetlands in Vermont. However, the federal government does not have sufficient resources or the political backing to effectively protect all Vermont wetlands. Accordingly, Vermont, like a number of other states, has adopted its own wetland rules.

The Vermont Wetlands Rules (VWR) were originally adopted in 1990 and were last revised effective August 1, 2010. Generally speaking, the VWRs regulate activities in wetlands by (1) providing for a system in which wetlands are classified according to their ecological significance, with some receiving greater protection from anthropogenic activity than others, (2) specifying a process by which wetlands are delineated, and (3) allowing certain activities within wetlands and their associated buffer zones based upon whether those activities impact ten “functions and values” established by the VWR.

D. Destroying Vegetated Riparian and Littoral Buffers

Another stressor to surface waters that is receiving increasing attention is the absence of riparian (streamside) and littoral (lakeside) vegetated buffers. Forested buffers provide habitat and cover for aquatic species and can help keep streams cool. Buffers can also help stabilize banks and filter nutrients that would otherwise run into waterways. By depositing large woody debris into streams, forested riparian buffers help create pools and riffles and broad stream beds, thereby maintaining habitat for aquatic organisms. The lack of vegetated riparian buffers and the altered hydrology caused by compacted landscapes has been shown in some instances to cause stream banks, in both developed areas and next to farm fields, to erode or slump into streams in large chunks through a process known as mass wasting. In agricultural lands in particular, phosphorus is present in the surface soil in large quantities. It is also present in developed and urbanized areas. Because phosphorous attaches itself to soil particles, a

38. Id.
single mass wasting event may contribute tons of phosphorous to the adjacent stream and thus into downstream waters.

In recent years, Vermont has enacted regulatory and incentive-based programs to limit the removal of vegetative riparian buffers and to encourage the restoration of buffers lost to erosion and over-clearing for farming or for development.\textsuperscript{39} Act 250 and national flood insurance programs place some limitations on development in floodplains,\textsuperscript{40} and numerous municipalities have adopted ordinances to protect riparian and littoral zones. However, the state does not directly regulate these important ecotones. Despite millions of dollars spent on cleanup plans for impaired waters, the state still does not require farmers to fence livestock out of streams. This oversight makes it difficult for the state’s cleanup plans to pass reasonable muster.

\textit{E. Lack of Political Will}

Legally and scientifically sound administrative systems designed to protect and restore public water resources have been in place for decades. These systems rely on proven pollution-control technologies and practices and on management plans organized around the limited capacity of streams and lakes to assimilate pollutants. But make no mistake, implementing programs based upon these strategies will be expensive and will require a cultural and political commitment to resource protection, which has been sorely lacking.

As the old saying goes, “dilution is the solution to pollution.” But the state’s lakes and streams can absorb only so much. Pollution control strategies that rely on the \textit{assumed}, but not the \textit{scientifically-documented}, ability of receiving waters to disperse pollutants must be abandoned. To assimilate receiving waters, the state should replace these strategies with those that budget the introduction of pollutants based on the actual capacities of the waters.

Vermont’s continuing failure to bring its polluted waterways into compliance with legal standards is due directly to the continuing refusal of the state’s executive branch to properly assess the assimilative capacity of receiving waters and then to connect funding and cleanup programs to this physical fact. The indisputable need to organize water pollution control around the capacity of the receiving waters, rather than the demands of dischargers, has become Vermont’s inconvenient truth.

\textsuperscript{39} VT. STAT. ANN. tit. 10, § 1427 (2010).

\textsuperscript{40} See VT. STAT. ANN. tit. 10, § 6086(a)(1)(d)–(f) (2010) (requiring permit for development or subdivision affecting floodways, streams, and shorelines).
The next section provides a brief primer on water pollution control law. This is followed by a short history of how Vermont has struggled—and largely failed—to effectively implement these laws. Finally, this paper offers some recommendations on how to restore and maintain Vermont’s water resources in the face of formidable challenges.

II. THE FEDERAL AND STATE REGULATORY SCHEME FOR WATER POLLUTION CONTROL

Water pollution in Vermont is subject to a complex combination of federal and state regulations. Vermont, like most other states, has sought and accepted delegation from EPA to implement the federal Clean Water Act within its borders. Through the National Pollutant Discharge Elimination System (NPDES) permitting program, the Clean Water Act directly controls discharges of pollutants from point sources.

Point sources are discrete, confined conveyances, such as pipes and ditches. Nonpoint-sources, which include unconcentrated runoff and atmospheric deposition, for example, are not subject to the NPDES program. The NPDES permitting system extends to certain categories of stormwater runoff, including runoff from municipal areas and industrial sites, large animal farms, and runoff from construction sites over one acre. For the most part, the Clean Water Act leaves large swaths of post-construction (operational) stormwater runoff and all nonpoint-source pollution control for the states to regulate, with some financial and technical assistance from the federal government.

In addition to managing the federal Clean Water Act, Vermont has adopted its own stormwater permitting program to help manage the operational stormwater discharges that federal law leaves unregulated. Unlike the federal law, Vermont’s stormwater permitting program is not limited to point-source discharges. Rather, jurisdiction under Vermont’s stormwater permitting program depends on the amount of impervious surface created by new development. ANR, through its Department of

44. VT. STAT. ANN. tit. 10, § 1264(a) (2011).
45. Id.
Environmental Conservation, manages both the NPDES permitting program and Vermont’s stormwater permitting program through the Vermont Water Pollution Control Act and accompanying state regulations.\textsuperscript{46}

Both the federal and state water pollution control laws in Vermont deploy a two-tiered strategy. In tier one, discharges subject to these permitting programs must comply with certain technological controls. In the case of conventional point-source discharges—industrial and municipal wastewater treatment facilities—these treatment requirements are known as technology-based effluent limitations (TBELs). TBELs do not specify the actual technologies that need to be employed, but rather state the levels of specific pollutant parameters allowed in the discharger’s wastewater. In other words, TBELs are expressed as end-of-pipe water quality conditions without regard to the ability of the receiving waters to accept the discharge.

The required TBELs differ depending on the nature and source of the discharge. Thus, every sewage treatment plant must use both primary and secondary treatment. Primary treatment settles solids, and secondary treatment employs living microorganisms to digest the bacteria in the remaining liquid.

For stormwater discharges, tier-one technology-based controls are commonly referred to as best management practices, or BMPs. Dischargers of stormwater above certain volumes must utilize detention ponds, vegetated swales, infiltration systems, low-impact development, and other structural or design practices to help regulate stream flows and to remove some pollutants, including phosphorous. The required BMPs are linked to site conditions, especially the area of the impervious surfaces from which rainwater runs off. The law presumes that deploying the necessary BMPs will control the volume and content of stormwater discharges to levels sufficient to protect water quality.

Technology-based controls (TBELs and BMPs) are knee-of-the-cost-curve solutions. They generally represent the most pollutant removal per dollar invested. Technology-based controls, however, are not the only treatment technologies available, and, despite the name, best management practices do not always represent the best pollution control practices possible.

Tier-one technologies are typically enough, or are presumed to be enough, to maintain legally acceptable water quality. However, when water quality is threatened or actually drops below legal standards, water pollution control administrators must move to tier two and replace or complement TBELs and BMPs with WQBELs—water quality based effluent limitations. Unlike TBELs and BMPs, which are determined by the type of discharge (e.g., meat packing plant, paper mill, certain acreages of pavement, etc.), WQBELs are determined by the limited capacity of the receiving waters to assimilate pollutants. The focus shifts from the end of the pipe to the assimilative capacity of the receiving waters.

All states delegated to administer the Clean Water Act, including Vermont, have adopted water quality standards for all surface waters in the state. Under the Clean Water Act, all waters must be fishable and swimmable, but not all waters need to be pristine. Water quality standards represent the goals or uses for the various streams and lakes in the state. Acceptable uses include but are not limited to public water supplies, recreation, irrigation, and fish and wildlife habitat. The receipt or dilution of pollution is not an acceptable goal or use, but discharges of pollutants may be permitted provided those established uses are protected.

State water quality standards ensure that established uses are protected by means of water quality criteria. Criteria may be numeric (e.g., micrograms per liter of phosphorous) or narrative (e.g., no toxins in toxic amounts). The Vermont Water Quality Standards provide different numeric phosphorous limits for different segments of Lake Champlain because different parts of the lake are naturally more eutrophic than others. The limits established are based on user surveys that determined the point at which unnatural levels of eutrophication become a nuisance for recreation.

Under section 303(d) of the Clean Water Act, state water pollution control administrators must list all waters of the state that fail to meet water quality standards or that are threatened with failing to meet these standards. This list of threatened and impaired waters (or water-quality-
limited segments) is often called the “303(d) list” for short. The state must develop a cleanup plan designed to bring the listed waters into compliance with water quality standards and remove them from the list when compliance is achieved.

WQBELs must be designed so that all the permitted and unpermitted discharges and runoff into a stream or lake, from both developed and undeveloped sites, collectively do not result in a violation of the water quality standards (uses and criteria) that the state has established for the receiving waters. Establishing WQBELs for a single discharge can be relatively simple. Thus, if a sewage treatment plant causes a violation of water quality standards despite secondary treatment, then an appropriate level of tertiary treatment, which may involve chemical neutralization of pollutants prior to discharge, could be determined without much difficulty.

Establishing WQBELs becomes much more challenging when multiple sources of pollutants contribute to the violation of water quality standards, especially if some of those sources are stormwater discharges. Sewage treatment plants and other conventional sources of water pollution (e.g., industrial sources) can be permitted using a steady-state analysis. This assumes that certain minimum flows in the receiving waters are available to dilute the discharges and that the quality and quantity of effluent coming out of the discharge pipes is about the same all the time or can effectively be predicted and adjusted. The assumed minimal flows available for dilution are the drought conditions that could be expected to occur over the course of one week every ten years, typically abbreviated as 7Q10. A steady rate of discharge can be permitted for conventional sources because, on average, the number of times people flush their toilets and do their wash remains constant, and the maximum amount of pollutants a factory needs to discharge can be determined and permitted in advance. Treatment techniques are so sophisticated for conventional discharges that effluent limitations for metals are measured by micrograms per liter, which translates roughly to parts per billion.

Unlike conventional steady-state discharges, stormwater discharges vary considerably from day to day and year to year, depending principally on rain events. Moreover, the affordable treatment techniques for stormwater are far less efficient than those available for conventional pollutants. A stormwater detention pond, for example, may typically remove less than half the phosphorous coming into it. That means that two comparable developments with stormwater BMPs discharge about the same amount of phosphorous that one of those developments would discharge without any treatment at all.
For polluted waters like streams in Chittenden County (Vermont’s most urbanized county, which includes Burlington—the state’s largest city) and Lake Champlain, which receive pollutants from multiple sources, tier two of the state and federal water pollution control programs requires Vermont to allocate pollutant loads among discharges or categories of discharges by means of TMDLs. The total load allocation of pollutants to all sources, including point sources and nonpoint sources, must not exceed the assimilative capacity of the receiving waters. TMDLs consist of a “wasteload allocation” for present and future point sources, a “load allocation” for present and future nonpoint sources, and a “margin of safety” to account for errors in estimating loads and the pollutant removal efficiencies of prescribed treatment technologies and practices. NPDES permits and state stormwater permits must be consistent with applicable TMDLs. Nonpoint sources that are not governed by federal or state permitting programs may be managed through technical or financial outreach or may be brought into state regulatory programs through changes in state statutes or rules. However, TMDLs must include reasonable assurances that reductions in nonpoint-source pollutants will occur within a reasonable time frame so that overall pollutant targets will be achieved.53

The key point of establishing WQBELs in tier two by means of a TMDL compared to employing TBELs and BMPs in tier one is to back calculate. An effective cleanup plan based on a TMDL implements a pollutant budget. It determines the total pollutant load that the receiving waters can assimilate and then allocates that load among all pollutant sources, present and anticipated. All those sources must then employ treatment practices sufficient to bring the total load down to levels that the receiving waters can assimilate.54


54. Considerable controversy exists over whether or how complex stormwater pollution problems can be redressed through pollutant budgeting. Models and assumptions used in estimating pollutant loads and load-reduction efficiencies of treatment practices are far from perfect. However, these tools have long been employed on smaller scales. It should be possible to employ these tools on a larger scale through a watershed, subwatershed, and site basis to form a mosaic of loading sources and load reduction practices that represents an overarching plan. The Vermont Agency of Natural Resources has already broken certain stormwater-impaired streams into sewersheds. Inaccuracies in estimating existing loads and the load-reduction efficiencies of various prescribed treatment practices can be narrowed through experience and by adjusting budgeting figures through the adaptive management process. See In re Montpelier WWTF Discharge Permit, No. 22-2-08, at 9 & n.10 (Vt. Envtl. Ct. June 30, 2009), available at http://www.vermontjudiciary.org/gtc/Environmental/Opinions.aspx (explaining in its recent decision the shortcomings of the Lake Champlain Phosphorus TMDL, and likening an effective cleanup plan to a financial budget).
Beginning in the early 1970s, when Congress passed the Clean Water Act over President Nixon’s veto, Vermont and other states, through the Clean Water Act’s state-federal partnership, made great strides toward restoring and maintaining the nation’s waterways. Through a combination of funding and enforcement, state and federal agencies responsible for administering and enforcing the Clean Water Act forced dischargers of conventional point-source pollution (principally municipal sewage and industrial wastewater) to comply with the Clean Water Act’s tier one technology-based controls. Teams of administrators, engineers, and lawyers administered and enforced the NPDES permitting program through the police powers of the states. Targeted discharges were numerous but were sufficiently limited in number as to be readily identifiable. When municipalities or industries resisted, pollution control agencies had the legal tools and the political support to bring them into line with the Clean Water Act’s science-based permitting requirements.

As the population of America grew and water use patterns changed, the gains in water pollution control from permitting conventional discharges often failed to outpace the losses wracked up by point-source and nonpoint-source runoff from urban sprawl and farming. Vermont and other states can no longer lay the blame for water pollution on a convenient list of sewage treatment plants and industrial sites. The contribution to diminished water quality from agriculture, development, and other human activities is well established. The responsibility now lies with all of us—and so must the solution, through our collective political will.

Through years of litigation, millions of dollars spent, and many promises to protect the environment, Vermont’s executive agencies have resisted pollutant budgeting and other essential policies for cleaning up the state’s polluted waters. The existing federal and state regulatory schemes for managing Vermont’s waterways are fundamentally sound, but they cannot work if they are not fairly and effectively administered and enforced. The next section explores some examples of how Vermont has neglected—and, at times, actively resisted—its responsibilities to manage Vermont’s public water resources and the litigation and legislation that have ensued.

55. In addition, the regulatory approaches that proved so effective in the early years of implementing the Clean Water Act fell out of favor with the Reagan Revolution. As Southern Democrats fled to the Republican Party in the wake of Democratic civil rights legislation, environmental regulation became a prime locus of resentment against government. In a sense, for many conservatives green became the new black.

56. For a detailed exploration of how environmental law and science have failed in the face of cultural obstacles see JAMES GUSTAVE SPETH, The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability (Yale Univ. Press 2008).
III. VERMONT’S BATTLES OVER ITS PUBLIC WATER RESOURCES

A. In re Hannaford

Vermont’s shortcomings in regulating stormwater runoff made headlines near the end of the Dean Administration in 2001, following the Vermont Water Resources Board’s decision on preliminary legal issues in the case of In re Hannaford.\(^{57}\) CLF appealed a stormwater discharge permit that ANR had issued for a proposed commercial shopping center in South Burlington. The appeal alleged that the permit unlawfully authorized new stormwater discharges into stormwater-impaired waters—in this instance, into a small stream called Potash Brook and then into Lake Champlain by way of Potash Brook and certain unnamed watercourses.

ANR had issued the permit on the basis of technology-based controls (BMPs), even though it had included Potash Brook and Lake Champlain on the state’s 303(d) list of waters impaired for phosphorus. Including Potash Brook and the lake on the state’s 303(d) list meant that a TMDL needed to be developed under state law to establish WQBELs for discharge permits; however, the state did not have a cleanup plan in place. Therefore, the appeal presented the novel issue of whether or how discharges of stormwater into stormwater-impaired waters could be permitted in the absence of a TMDL. The Board was not able to locate any case law from any state or federal jurisdiction on the issue except for a 1978 Water Resources Board decision that relied on state law to prohibit a stormwater discharge into a stormwater impaired stream.\(^{58}\)

Interestingly, CLF argued for beefed up BMPs, believing that requiring and then developing a TMDL would only delay the cleanup effort and result in a plan that would still need to be implemented. ANR argued vehemently that, because stormwater is different from conventional discharges, its current technology-based controls were all that was necessary, even though the waters were violating the state’s Water Quality Standards.\(^{59}\) In keeping


\(^{58}\) Pyramid Co., No. WQ-77-01, 1977 WL 187947, at *9 (Vt. Water Res. Bd. 1977). In 2007, in a case that parallels the Board’s construction of state law in Hannaford, the United States Court of Appeals for the Ninth Circuit held that an NPDES permit may not be issued under the federal Clean Water Act for new or increased discharges of pollutants of concern into impaired waters in the absence of a TMDL. Friends of Pinto Creek v. U.S. E.P.A., 504 F.3d 1007, 1017 (9th Cir. 2007).

\(^{59}\) Hannaford, 2001 WL 34064020, at *5. The Board had recently decided, in In re Home Depot USA, No. WQ-00-06, Mem. of Decision: Motion to Alter at 4 (Mar. 16, 2001), that discharges of stormwater into water that are not impaired enjoy a rebuttable presumption of compliance with the Vermont Water Quality Standards. In Hannaford, however, the fact that the waters at issue were impaired rebutted any presumption of compliance. 2001 WL 34064020, at *16–17.
with the two-tiered approach of water pollution control law, the Board disagreed with both sides and held that permitting new or increased discharges of stormwater into stormwater-impaired waters in the absence of the TMDL was prohibited by the Vermont Water Pollution Control Act and state regulations. 60 To obtain a permit, the applicants would need to prove at an evidentiary hearing that their proposed development would not increase the stormwater pollutants coming off the site. 61 The Board added that the TMDL and anti-degradation requirements of the state’s pollution control laws should prevent the prohibition against new or increased discharges into impaired waters from encouraging the sort of development sprawl that would lead to additional impaired streams. 62

The Board issued its decision on the basis of state law because ANR issued the permit under appeal pursuant to the state’s stormwater program and not under the NPDES of the federal Clean Water Act. Moreover, the parties agreed that federal requirements were not at play in the case. 63 However, the Board carefully considered the provisions of the Clean Water Act and regulations that prohibit new or increased discharges into impaired waters in the absence of a cleanup plan. 64 In fact, early drafts of the Hannaford decision included an extensive discussion of the Clean Water Act, including the possibility that the discharge at issue required an NPDES permit pursuant to the Clean Water Act’s residual designation authority. 65 Although the Board edited the discussion of federal law from the final decision, the Board eventually incorporated much of the cut material into a later case in which the residual designation authority was directly at issue. 66

The Board’s decision in Hannaford led to near hysteria in the media and in circles of power across the state. Hyperbolic accusations flew around that the Board had shut down virtually all new development in Vermont. Media outlets widely (and incorrectly) reported that the Board had denied the permit, even though the Board had merely ruled on preliminary issues of law and had not yet determined whether the proposed development and treatment systems would unlawfully result in a new or increased discharge

60 Hannaford, 2001 WL 34064020, at *15.
61. Id. at *19.
62. Id. at *16.
63. Id. at *18.
64. See 40 C.F.R. § 122.4(i) (2011) (describing what is required when adding a pollution source into a water body that does not meet water quality standards).
into the receiving waters. Irate developers and their attorneys confronted Board members on the streets and Board staff at professional functions.

ANR filed a motion to alter with the Board, the permit applicant moved to dismiss the appeal, and the Vermont Agency of Commerce and Community Development, along with a regional industrial group, moved to intervene in the case. The Board granted the motions to intervene as a matter of course and scheduled a hearing on the motions to alter and to dismiss. At the hearing on these motions, the Board’s Montpelier conference room was packed with reporters, television cameras, spotlights, microphone arms, and spectators. Holding steady, the Board denied the motions and scheduled an evidentiary hearing on whether the permitted treatment systems met the standard of no new or increased discharge.67

As the case moved ahead, ANR continued to insist that stormwater permits should be written only by means of its existing BMPs, even though there was no evidence that doing so would improve water quality and the Board had already rejected that approach. In addition, the Agency argued that the Board should define the legal standard of no new or increased discharges in terms of ecological impacts rather than mass loads. The Agency preferred an impacts analysis rather than a loading analysis because, the argument went, the receiving waters were already so polluted that the impacts from any one new development would not be measurable, and, therefore, permits could be issued indefinitely for increased discharges. The Board rejected ANR’s arguments and ruled that state law prohibited new or increased loads rather than impacts.68

The appellants urged the Board to deny the permit, or, in the alternative, to issue the permit with the condition that the discharge not exceed predevelopment conditions. The Board rejected those arguments as well and decided that the existing discharge from the site represented the appropriate baseline for determining whether a proposed discharge into impaired waters lacking a cleanup plan would be “new or increased” and, therefore, prohibited.69 The Board reasoned: “Using background conditions as a cap on stormwater discharges into impaired waters . . . could needlessly impede efforts to improve the condition of impaired waters through technology controls prior to establishing a [pollutant load] allocation.”70

68. Id. at *6.
70. Id. at *10.
Following the fact-finding hearing, the Board held by a vote of four-to-one that the developers had met their burden of proving that the BMPs they planned to use would prevent any increase in pollutant loading from the site. The Board therefore affirmed the issuance of the stormwater discharge permit.71 Because the developers received their permit to discharge into impaired waters, the environmental groups appealed the decision to the Superior Court. On appeal, the Board’s decision was affirmed.72

The developers in Hannaford were able to meet the strict standard of no new or increased loads of pollutants of concern because the project site was already disturbed and their proposed treatment systems would capture the existing untreated runoff. Portions of the project site had been used to dump solid waste from the construction of I-189. However, the stakeholders realized that, in most instances, proposals to develop raw land would not be able to meet the standard of no-new-or-increased-loads of stormwater pollution. The Hannaford decision therefore poured sand in the gearbox of the state’s stormwater permitting mill. Moreover, Hannaford laid the groundwork for a series of additional cases in which the Vermont Water Resources Board was called upon to decide, in the first instance, issues of national import in water pollution control.73

B. Watershed Improvement Permits

Following Hannaford, interest groups turned their attention to the Vermont Legislature, which rewrote the state’s stormwater law. In doing so, the Legislature essentially adopted the Board’s decision, but, in line with longstanding federal law, the Legislature provided for the issuance of Watershed Improvement Permits (WIPs) as an alternative to TMDLs.74 The state’s immediate interest was to keep the permitting process going, and ANR set to work on developing WIPs, which, if not successfully challenged by environmental groups, would render the Hannaford no-new-discharge standard for impaired waters without cleanup plans inapplicable.

71. Id. at *18–19.
73. It is noteworthy that the Water Resources Board consisted of five citizen volunteers appointed by the Governor, an executive officer, two staff attorneys, and an administrative assistant.
It is interesting to note the extent to which the permitting restrictions resulting from *Hannaford* led to so much press and captured so much time and energy on the part of Vermont’s development community and the Legislature. Previously, the lingering and worsening state of Vermont’s stormwater-polluted waters had garnered relatively little attention. It was the spanner that the Board threw into the state’s permitting works in *Hannaford* that got people motivated, more than the deteriorated condition of the receiving waters or the absence of any workable plan for cleaning them up—which the *Hannaford* decision also brought to light. ANR finally set about to develop cleanup plans only because such plans were necessary to allow the Agency to continue issuing discharge permits. As the Board found, the law linked the availability of discharge permits to maintaining or improving water quality, and that is what got the cleanup process underway, not any inherent concern on the part of the government for the state’s stormwater problem.

In fact, in the wake of *Hannaford*, some rather embarrassing details relating to the state stormwater permitting program came to light. It turned out that ANR had cannibalized its stormwater program to cope with budget cuts during the Dean Administration. The Agency eventually disclosed that nearly 2,000 state stormwater permits had expired or were out of compliance. In some cases, permitted systems had never been built, some had been built incorrectly, and others had been built but had fallen into disrepair. Although the state lacked the resources to enforce existing stormwater permits prior to *Hannaford*, it could not ignore the demands of developers for new permits. As a consequence, the state directed millions of dollars that were previously considered unavailable into its stormwater program after *Hannaford*.

**C. In re Morehouse Brook**

In 2003, when the Governor’s Office passed from Howard Dean to James Douglas, stormwater in Vermont once again made headlines. After *Hannaford*, ANR seized upon the provisions in the new stormwater legislation that authorized WIPs under some circumstances. Through WIPs, ANR attempted to get past the Board’s tough permitting standard for polluted waters without TMDLs. The Agency established WIPs rather than TMDLs for a handful of stormwater-impaired streams in Chittenden

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75. See, e.g., Nancy Bazilchuk, *Vermont Allows Stormwater Permits to Lapse*, BURLINGTON FREE PRESS, Mar. 18, 2002, at A1 (explaining why allowing stormwater permits to lapse results in permitted systems not being built and others falling into disrepair because the permits are not being enforced statewide).
County. The WIPs applied updated stormwater BMPs to new stormwater discharges and selected existing discharges for retrofits.

VNRC and CLF appealed the issuance of the WIPs to the Water Resources Board in *In re Morehouse Brook*, alleging that the WIPs failed to ensure that the receiving waters, which remained impaired by stormwater, would come into compliance with the Vermont Water Quality Standards.76 Again, the appellants did not argue for TMDLs, but rather for enhanced WIPs with better and more widely applicable BMPs.77 The environmental groups continued to regard TMDLs with suspicion, fearing that the planning process was time-consuming and would ultimately result in a plan to cleanup rather than actual cleanup.78

Douglas’s ANR reiterated the argument that the Agency made under Dean in *Hannaford* and that the Board had already rejected—that it was impossible to create TMDLs for stormwater. In its dogged effort to avoid TMDLs, ANR actually argued against its own statutory authority to regulate nonpoint-source discharges. Further, the Agency contended that the WIPs justified new and increased pollutant loads into the receiving waters, even though the WIPs did not contain any schedule for bringing these waters into compliance with the Vermont Water Quality Standards or any demonstration that this would ever happen.79 The Agency argued for the iterative application of BMPs through a series of WIPs until the receiving waters complied with the Water Quality Standards.80

*Morehouse Brook* presented the Board with the novel issue of when cleanup plans other than TMDLs are authorized.81 Here again, the Board decided the case under state law, but with a view to federal law that applied to other kinds of discharges.82 But, once again, the Board was left to decide the issue without any definitive case law from other jurisdictions—state or federal.

After a hearing on the merits, the Board reversed the issuance of the WIPs and again instructed the Agency to develop TMDLs for the waterways at issue.83 The Board explained that WIPs were suitable for simpler water pollution problems where the pollutant sources could be

77. *Id.* at 23.
78. *Id.* at 20.
79. *Id.* at 22.
80. *Id.* at 22.
81. *Id.* at 6.
82. *Id.* at 18.
83. *Id.* at 29.
readily identified and remedied.\textsuperscript{84} In complex environments (such as those in the Morehouse Brook case), however, TMDLs needed to be developed to show that new discharges would not swallow up the pollutant reductions from existing sources.

Simply put, without a pollutant budget, the Agency could not demonstrate that the application of BMPs to certain categories of stormwater discharges would reduce pollutant loads to the point that the receiving streams would comply with the Vermont Water Quality Standards and remain in compliance while receiving future discharges. Once again, the Board determined that ANR improperly relied on the use of technology-based permitting where water-quality based permitting was required. The Board specifically ruled that the forward-looking iterative application of BMPs was not appropriate for these waters and that the Agency needed to develop TMDLs that back-calculated from the assimilative capacity of the receiving waters and allocated pollutant loads accordingly. The Board pointed out that the data that ANR had gathered to implement the WIPs could be applied to pollutant budgets in the form of TMDLs.\textsuperscript{85}

\textbf{D. The Water Resources Board’s Investigation of Stormwater TMDLs}

ANR decided not to appeal Morehouse Brook, conceding that the Board was theoretically right on the law. Instead, the Agency attacked the Board on the science and continued to insist that TMDLs for stormwater were not technically feasible. It appeared to the Board, from the evidence presented in the Hannaford and Morehouse Brook cases and from its review of the literature, that TMDLs were both possible and necessary to address Vermont’s stormwater pollution. In an effort to resolve the technical uncertainties obstructing the development of stormwater TMDLs, the Board launched a formal investigation into this important policy issue. The Board had long been authorized to conduct formal investigations of water resources issues but had never done so before.

The Board assembled a representative group of stakeholders and experts, and, following several months of meetings, the stakeholder group reached consensus that TMDLs were both possible and necessary to address stormwater pollution and agreed upon a technical framework for developing them. Among other things, the stakeholder group helped pioneer the use of flow and sediment as surrogates for the panoply of pollutants in

\textsuperscript{84} Id. at 27.
\textsuperscript{85} Id. at 19.
stormwater runoff. The Board issued its formal report on the investigation in March 2004.86

E. Interim Permitting

Although ANR finally agreed to establish TMDLs for Vermont’s stormwater-impaired streams, its first order of business was to facilitate interim permitting while this time-consuming and expensive process got underway. The Agency took over the Board’s stakeholder group to address this issue, and the Legislature eventually amended the state’s stormwater law again to deal with it. Essentially, the Legislature maintained the Hannaford no-new-or-increased-pollution standard for impaired waters without cleanup plans, reaffirmed the Board’s interpretation of the limited role of WIPs, ordered ANR to develop TMDLs by a date certain, and authorized the use of offsets to facilitate net-zero permitting while TMDL development was underway.87

While the interim permitting system pending the development of cleanup plans for impaired waters keeps the permitting mill turning, it inevitably does so at the expense of water quality and may push certain waterways to a point of no return. First, this system removes at least some of the urgency to develop cleanup plans. Second, the new system allows certain stream segments to become more polluted as long as an offset somewhere in the watershed purportedly leads to no net increase in pollution at some point farther downstream. If the point of measurement lies at the bottom of a large enough watershed, then increased pollutant loads into one segment are averaged out or rounded off.88 Third, the system is easily gamed, and, in at least some cases, it appears doubtful whether the offset (e.g., a vegetated riparian buffer) will actually remove as much pollution as the new discharge (e.g., a commercial development) will contribute. Fourth, the net-zero permitting program allows watersheds to continue to be built out without comprehensive cleanup plans, potentially making effective load reductions through a TMDL much more difficult to achieve because of the increased number of retrofits that may be required.

88. See Ann Powers, The Current Controversy Regarding TMDLs: Contemporary Perspectives, 4 VT. J. ENVTL. L. 9, 18 (2003) (noting that the boundaries for water pollutant trading must ensure that “the environmental consequences of trades between parties occur in the same waterbody or stream/river segment, that boundaries are of manageable size, and are selected to prevent localized problems”).
Here again, development pressures are eating away public water resources, even in a state like Vermont, which has worked doggedly on water pollution control.

F. In re Stormwater NPDES Petition

As ANR set out to develop stormwater TMDLs, the last act in the stormwater litigation that occupied the Vermont Water Resources Board before it was abolished through Governor Douglas’s permit reform initiative began to unfold. Following their previous successes in Hannaford and Morehouse Brook, VNRC and CLF petitioned ANR to require federal NPDES permits rather than state permits for operational (post-construction) discharges of stormwater into the five streams involved in the Hannaford and Morehouse Brook cases. As noted above, federal regulations require NPDES permits for certain categories of stormwater discharges. However, federal law stops short of categorically requiring all operational stormwater discharges to obtain NPDES permits. Instead, the regulations grant state water pollution control administrators the authority to designate these residual discharges for NPDES permitting if the discharges contribute to a violation of state water quality standards or constitute a significant discharge of pollutants.

In their petition to ANR, the environmental groups seized on the Board’s finding that all of the discharges in the stormwater-impaired waters that the Board addressed in Hannaford and Morehouse Brook contributed to the impairments of the streams at issue. The Board came to this conclusion because, in the complex watersheds at issue, all of the discharges combined

89. Permit reform transferred the appellate functions of the Environmental Board and the Water Resources Board to the Environmental Division of the Vermont Superior Court. The rulemaking functions of these Boards were transferred to the Water Resources Panel and the Land Use Panel of the newly created Natural Resources Board. 16-5 Vt. CODE R. § 200:1 (2012). Permit reform served some beneficent purposes. Although the Boards were run efficiently and the decisions were well-reasoned, the quantity, complexity, and public profile of the cases were becoming too much to continue to ask citizen Board members to handle. And proponents for change were correct in pointing out that the appeal routes for various permits in Vermont (e.g., water supply, water discharge, state land use, municipal zoning, waste storage, air emissions, etc.) involved a labyrinth of different boards, courts, and commissions. Eliminating the Boards was also red meat to the development community, which resented certain decisions that the Environmental Board and Water Resources Board had made and which found the accessibility of these boards to citizen opponents of projects particularly frustrating. Prior to their elimination, the Boards and their professional staffs conducted a functional and financial alternatives analysis and recommended that the Legislature establish professional boards rather than transfer their functions to the Environmental Division. The Legislature has begun to reconsider this recommendation. See, e.g., S. S.28, 263875th Sess. (Vt. 2011), available at http://www.leg.state.vt.us/docs/2012/bills/intro/S-028.pdf.

90. Proposed Rulemaking, supra note 46.
to produce excess pollutant loads to the receiving waters. Therefore, a comprehensive approach, in the form of a TMDL, was required to reduce these loads to meet legally established water quality criteria. The environmental groups reasoned that, because all of these discharges contributed to the violations, they all required NPDES permits under the state’s residual designation authority.

Although the case sounds academic at first blush, the stakes were quite high. Using its enforcement discretion, ANR had largely ignored violations of state operational stormwater permits, or it had at least gone easy on violators. The federal permit program, however, is another matter entirely. Dischargers who violate federal NPDES permits are subject to citizen suits under the Clean Water Act, and federal permits are subject to federal standards, which had not yet been resolved for operational stormwater dischargers at the time. Much of the historic success of the Clean Water Act has been attributed to citizen suits, which allow citizens with legal standing to do the job that government agencies often lack the resources or the political backing to do themselves. In addition, NPDES permits issued under the residual designation authority would apply to dischargers that are grandfathered, and thus exempt, under the state’s stormwater permitting law. Furthermore, federal law prohibits new or increased discharges into impaired waters lacking a cleanup plan. Thus, it is questionable whether federal permits can be issued under Vermont’s interim permitting standards, which were designed to circumvent the prohibition against new or increased discharges that the Water Resources Board set forth in Hannaford.

ANR denied the residual designation petition of the environmental groups. The groups then appealed the Agency’s decision to the Vermont Water Resources Board. The Board was again presented with a novel issue of national import in the control of stormwater runoff, with little or no precedent from other jurisdictions. The arguments advanced by the Agency in defense of the status quo were numerous, lengthy, and often lacking in substance. Indeed, ANR reworked its failed argument in Hannaford and contended that a discharge cannot be subject to NPDES permitting unless that discharge alone would impact water quality by itself. In the end, the Board relied on the simple and plain language of the federal regulations and remanded the case to the Agency. On remand, the Agency was ordered to issue NPDES permits to all but de minimis contributors of stormwater to these polluted streams.91

ANR, with the assistance of the Attorney General, appealed the case to the Vermont Supreme Court. National development and commercial interests joined the Agency’s efforts to defend its decision not to use its residual designation authority to require dischargers of stormwater to Vermont’s stormwater-impaired streams to obtain federal permits. The Vermont Supreme Court affirmed nearly all of the Board’s decision, but it reversed the Board’s conclusion that all but de minimis discharges required permits as a matter of law, and remanded the case to the Agency. The Agency was ordered to make factual determinations about which discharges were contributing to the problem—essentially the same as the Board had ordered.92

On remand, the Agency once again denied the petition. VNRC and CLF appealed to the Environmental Court, which had acquired jurisdiction over this matter after the Water Resources Board was abolished. Relying closely on the Board’s decision, the Environmental Court reversed the Agency’s denial of the petition and sent the matter back to ANR to issue NPDES permits to contributing dischargers.93 The Agency finally conceded and chose not to take the matter back to the Vermont Supreme Court.

On November 19, 2009, the Agency issued General Permit 3-9030,94 which requires NPDES permits for over 400 designated discharges into the five waterways at issue in In re Stormwater NPDES Petition. Coverage under the General Permit extends to discharges not covered by other federal discharge permits as well as those that do not meet the net-zero standard under the state’s permitting scheme. The General Permit requires covered dischargers to employ BMPs, depending on an engineering feasibility analysis of the site, to maximize infiltration and to reduce stormwater runoff.95

Prior to all of this litigation, ANR had, in fact, developed a phosphorous TMDL for Lake Champlain. The TMDL was vague, however, and the Agency failed to effectively implement it. The Lake Champlain Phosphorous TMDL (LCPTMDL) determined the total mass load of phosphorus that each of the lake’s segments can assimilate without violating the phosphorous concentrations established by the Vermont Water Quality Standards. It also allocated maximum loads to major tributary watersheds. However, the LCPTMDL failed to meaningfully describe how these contributing loads could be scaled back to enable the lake to assimilate existing and new discharges. Rather, it adopted the idea that an all-out effort would be required. As the environmental groups who argued for enhanced BMPs rather than TMDLs in *Hannaford* and *Morehouse Brook* feared, a water pollution control agency can (and did) write a TMDL that does not represent a true pollutant budget or even a decent budget to preserve the receiving water. After the LCPTMDL sat on the Agency's shelves for years, Vermont environmental groups convinced the Legislature to require the Agency to put it into effect. In 2008, the Legislature passed a law requiring the Agency to put the LCPTMDL into effect.

Vermont continues to resist true pollutant budgeting. The Vermont Environmental Court, in a strongly worded and critical opinion, found that

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97. The personal notes of the authors reveal that the Vermont Water Resources Board provided comments to ANR on a draft of the LCPTMDL in the summer of 2002. The Board expressed doubts that the draft was specific enough to represent a pollutant budget that made its authoring agencies (the Vermont and New York Departments of Environmental Conservation) accountable for its implementation. The Board commented that the draft argued for funding for a list of pollutant control strategies but failed to link those strategies to load reductions, thus leaving discharges connected to sociopolitical processes rather than to the assimilative capacity of the receiving waters. The Board questioned, as it recently had in *In re Morehouse Brook*, whether the iterative application of BMPs to nonpoint sources can substitute for WQBELs grounded in TMDLs. In its final version, the LCPTMDL did not address any of these concerns. Indeed, no one taking a close look at the LCPTMDL could have reasonably concluded that it represented a workable blueprint for bringing phosphorus pollution in the lake within legal limits.
98. See Vt. STAT. ANN. tit. 10, §§ 1385–1386 (2007) (requiring and outlining an implementation plan for the LCPTMDL). The Legislature found that there had been an increase in phosphorus loads into Lake Champlain and that phosphorus reduction efforts need to be quantified. Vt. AGENCY OF AGRIC., FOOD AND MKT., VT. AGENCY OF NATURAL RES., VERMONT ECOSYSTEM RESTORATION PROGRAM: 2011 ANNUAL REPORT 17 (2011), available at http://www.leg.state.vt.us/reports/2012ExternalReports/276255.pdf. In addition, the Legislature required load reductions to be allocated on a subwatershed basis. *Id.* ANR reports increasing phosphorus concentrations in some segments of the lake from 1990 to 2008, with no lake segments exhibiting decreasing concentrations. *Id.* However, ANR also measured stable or decreasing phosphorus inputs to most regions of the lake. *Id.*
ANR was relying on the dated and vague TMDL to give dischargers a right to pollute and that the TMDL on which it relied was so deficient that permits based on its allocations did not accurately represent WQBELs.99 In October of 2008, CLF sued EPA in federal district court to set aside the 2002 LCPTMDL and to develop a new one. In an April 2010 settlement agreement, EPA agreed to reconsider the LCPTMDL and to grant a stay of the litigation. Finally, on January 24, 2011, EPA withdrew its approval of the Vermont portion of the LCPTMDL and agreed to work with ANR to develop a new one.100 Based on this history, Vermont has never actually had a valid, workable cleanup plan for Lake Champlain.

In EPA’s disapproval of the LCPTMDL, and in other formal and informal discussions of water pollution in Vermont, the focus is belatedly, but inevitably, moving toward more algebraic thinking about pollutant budgeting. For example, the EPA found that at least certain components of the cleanup plan failed to provide any reasonable assurance that they would “adequately address the magnitude of the need. In short, the plan provides very little, if any, assurance that the recommended actions will occur, and provides no indication of the magnitude of phosphorus reductions expected from these actions.”101

Similarly, the Chair of the Vermont Citizen Advisory Committee for Lake Champlain Basin Program has recently shared some realistic talk with the Press:

Perhaps there is one big move left to make. Force the decisions and costs back directly on the sources of excess nutrient pollution in each watershed, with a strict measurable target to hit at the end of a stream or river going into the lake. Require all of those contributors to work out who does what and how they will pay for it in a process mediated by the state and observed by the EPA over a six-month period.102

To make the LCPTMDL effective, ANR needs to describe the dischargers or categories of dischargers who need to undertake specific cleanup tasks and determine when and how much pollution reduction is

99. In re Montpelier, supra note 33, at 19.


101. Id. at 11.

expected as a result. In the same vein, the Agency has now developed TMDLs for a number of stormwater-impaired streams in Vermont’s urban areas. To implement these plans, however, the Agency needs to link cleanup efforts to stormwater reductions.

Linking plans and clean up efforts is not an exact science. Consequently, implementing TMDLs requires adaptive management. ANR must use its best professional judgment to link cleanup efforts to load reductions that will be sufficient to bring the receiving waters into compliance with water quality standards. If the resulting actions prove to be too strict or too relaxed, then the Agency can revisit the implementation plan and make appropriate adjustments.

Unfortunately, ANR has consistently interpreted adaptive management to mean that it will iteratively apply cleanup efforts until such time as the receiving waters come into compliance with water quality standards. This approach does not realistically estimate how the BMPs, as applied to existing discharges, will offset new discharges of stormwater. This is the exact approach the Water Resources Board rejected in Morehouse Brook, when the Board overturned the WIPs.

Although Vermont has spent millions of dollars on programs to cleanup Lake Champlain and stormwater-impaired streams, these efforts will not succeed without a pollutant budget and the money will not be spent wisely. The present approach is similar to a financially reckless company pointing to all the ways it is working to save money, but without being able to show that these savings are bringing expenses within the company’s income. To make another analogy, trying to cleanup polluted waterways without a pollutant budget and pointing to all the efforts going into cleanup, but without achieving the desired results, is like failing at a diet. You can complain about how hard you’re trying and all the sacrifices you’re making and all the food you are not eating, but that won’t help you lose weight. It does not do to sacrifice potato chips and milkshakes only to eat extra french fries and ice cream or to walk everyday after work to take off calories only to reward yourself with a Snickers bar when you’re finished. Trying really

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103. For stormwater-impaired streams, ANR uses flow as a surrogate for pollutant loading, with the expectation that by effectively managing stream flows, pollutant loading, including sediment loads, will also fall into line. In re Developing Cleanup Plans for Stormwater-Impaired Waters, No. INV-03-01, (Vt. Water Resources Bd. March 9, 2004) (Order Closing Docket and Issuing Final Report for Comment), available at http://www.vtwaterquality.org/stormwater/docs/sw_inv-03-01report.pdf. The Water Resources Board generally endorsed this approach in its Final Report on Developing Cleanup Plans for Stormwater-Impaired Streams. Id. However, the Board expected that while flow could be used as a surrogate, TMDLs would simultaneously address sediment directly. Id.

104. See VT. STAT. ANN. tit. 10, § 1264(f)(4) (2011) (requiring compliance with BMPs in order to retain a storm water discharge permit). See ERIC MONSCHEIN, supra note 77 and accompanying text.
hard—without more—is not the way to cleanup stormwater-impaired waters.

Consistent with an overall policy emphasis on economic development, Governor Douglas touted a “Third Way” of managing Vermont’s environmental problems—a way in which protecting the environment would not interfere with economic growth. The Third Way told people what they wanted to hear—that they can grow in any manner they like without government regulations getting in the way, and that Vermont’s polluted waters are on their way to recovery. Perverting the concept of adaptive management to avoid back-calculating effectively dodges accountability. Governments can point to all of the efforts being taken to address water pollution without ever recognizing their limits.

In the early days of water pollution control, when regulatory agencies went after conventional point-source dischargers, progress was measured by penalties collected. As dischargers bristled under regulatory burdens and environmental regulations became a focal point of conservative wrath, technical and financial assistance began to supplant regulatory control. Now, instead of measuring progress by penalties collected, agencies measure progress by money spent. The government is now paying the people it used to regulate and fine. Money going to local environmental projects, public or private, rarely provokes a political backlash against the regulatory agency dispensing it. In the last decade, over $100 million\(^\text{105}\) has been spent on efforts to cleanup Lake Champlain, but phosphorus pollution in the lake is not getting better. In the face of this stalled progress, government officials cite the astronomical sum already spent on cleanup. The implication is that all one needs to do to get a cleaner lake is spend more money.

The Third Way keeps the permitting mill turning. Dischargers need to jump through certain hoops to get their permits, but the permitting program is still organized around the needs of dischargers rather than the assimilative capacity of the receiving waters. To clean up Vermont’s stormwater-impaired streams and Lake Champlain, it is essential to back-calculate: determine how much the waters can handle and work back from there to ensure that the total pollutant load from all sources—point and nonpoint—does not exceed those limits. To live sustainably, you must ensure that your spending does not exceed your revenues, that the calories you take in do not exceed the calories you burn, and that the amount of

\(^{105}\) Kathryn Flagg, *supra* note 35.
pollution you load into your waterways does not exceed their assimilative
capacity.106

After permit reform, the Vermont Water Resources Board’s appellate
jurisdiction, as noted, went to the Environmental Court. The rest of the
Board’s functions, including rulemaking, were transferred to the Water
Resources Panel of the Vermont Natural Resources Board. Two matters in
particular that came before the Water Resources Panel—basin planning and
wetlands regulation—further demonstrate the ongoing argument over
Vermont’s waterways.

H. Basin Planning and Anti-Degradation

Although federal and state law have required basin planning for
decades, ANR allowed basin planning to languish for so long that the
Legislature eventually mandated the Agency to develop basin plans for the
state’s 17 major drainage areas by the year 2000. In 1999, the Legislature
extended the deadline to 2006.107 The Agency presented its first updated
basin plan, the White River Basin Plan, to the Vermont Water Resources
Board in 2005.

Basin planning is accomplished in two steps. First, planners take
inventory of pollution sources, paying particular attention to nonpoint
sources that are not addressed through federal and state permitting
programs. Then, they coordinate management efforts based on the
inventory. Another important function of basin planning is to establish more
specific water quality standards for a basin’s waterways. Currently, the anti-
degradation requirements of federal and state water pollution control laws
require the maintenance of existing uses and water quality, some of which
may not be reflected in the water quality standards to be protected.
Unfortunately, Vermont has long resisted its legal obligations to develop an
anti-degradation implementation program to effectuate these requirements.

106. See In re Waters of the Green Mountain National Forest, No. ORW-03-01, (Vt. Water
Resources Bd. Aug. 9, 2005) (Findings of Fact, Conclusions of Law, and Order), available at
http://www.nrb.state.vt.us/wrp/decisions/wrbdecisions/2005/orw-03-01dec.pdf (illustrating the Agency’s
emphasis on permitting rather than protection. Due to certain technical shortcomings in the facts made
available to the Board, the Board denied a petition filed by an environmental group to designate some 66
lakes and streams in the Green Mountain National Forest as outstanding resource waters meriting
special protection. The Board made a point of denying the petition without prejudice, with the
expectation that it would be re-filed with new facts to correct the deficiencies in the record. The
environmental organization that originally filed the petition did not have the funding to resume the case.
Although the Agency of Natural Resources supported at least some of the proposed designations in the
hearings before the Board, neither the Agency nor the new Natural Resources Board have brought any
of the proposed designations to fruition.).

107. VT. STAT. ANN. tit. 10, § 1253(d).
Upgrading the water quality standards through basin planning would identify existing uses and water quality that would then be used to set the parameters for permitting and other water pollution control programs. This approach would take some pressure off of case-specific anti-degradation analyses.

In the White River Basin Plan, the Agency of Natural Resources attempted to set goals for waterways that fell below their existing water quality. In some instances, the Agency’s own bio-indices of water quality indicated that certain waterways would be most appropriately designated as Type 1 waters—those deserving of the highest level of protection within Class B. However, the Agency recommended the designation of some of these waters to Type 2—a lower category of water quality—in order to accommodate local development interests. In other situations, the Agency proposed Type 2 designations in forested watersheds, even though forest cover is strongly correlated with high water quality.

The Water Resources Board, by then dominated by Douglas appointees, adopted the Agency's recommendations. During the rulemaking process to effectuate the proposed changes to the Vermont Water Quality Standards, however, VNRC and other environmental groups convinced the legislative committee responsible for screening proposed rules to remand the proposed standards for the White River Basin back to the Board for reconsideration. Upon reconsideration, the Board handed the matter off to the Water Resources Panel of the Natural Resources Board.

A major issue that arose with water management typing was whether the management types were intended to represent new classifications (or uses) or new criteria for existing uses. Either way, legislative authority for an agency to develop and apply water management types was not clear. In 2009, the Water Resources Panel opened an investigative docket to look into the matter, which it rather vaguely titled the Science and Policy Advisory Committee (SPAC). SPAC established a laudable goal of integrating basin planning, water management typing, and anti-degradation. After the Panel spent months making little progress, the Legislature assigned the responsibility to establish water management types for at least two watersheds to regional planning commissions. Recently, the Panel issued a draft report on its SPAC that merely summarized the issues and the positions of stakeholders without reaching any decisions. After years of work, the Panel has still neither clarified the process for refining the
Vermont Water Quality Standards in the course of basin planning, nor sought appropriate legislation to clarify the process.109

I. Wetland Protection

In yet another chapter of Vermont’s ongoing argument over its water resources, the Water Resources Panel substantially revised and updated the Vermont Wetland Rules (VWR), but only after a prolonged battle with stakeholders.

1. Resistance to Change

The VWR, unlike the federal rules or those of other state wetland programs, had long relied on inaccurate wetland maps, rather than field identification of wetlands, to determine if the state has jurisdiction to regulate particular sites. The wetland maps in Vermont reportedly omitted up to 30% of the wetlands in the state—much more in some areas—and erroneously identified various other landscape features, including quarries, swimming pools, town fountains, and bedrock glinting in the sun, as wetlands. The mistake occurred because these areas look like wetlands on the aerial photographs used to create the wetland maps. This led to an arbitrary, inefficient, and administratively cumbersome regulatory program.110

Every year since the original adoption of the VWR in 1990, the Water Resources Board, and then its successor, the Water Resources Panel of the Natural Resources Board, entertained a half dozen or so petitions to remove erroneously identified wetlands from the Vermont Significant Wetlands Inventory (VSWI) Maps. In each of these cases, the Board or the Panel generally considered (and gave considerable weight to) the technical recommendations of ANR on these petitions. The Board, and then the Panel, also had jurisdiction under the VWR to add wetlands to the maps. But, despite routinely coming across unmapped wetlands in the course of its field work, in the nearly 20 year history of the old VWR, not once did ANR petition the Board or the Panel to add wetlands to the VSWI Maps.

Then, in 2005, the Vermont Supreme Court held in Lake Bomoseen Ass’n v. Vermont Water Resources Bd.111 that reclassification of wetlands

110. See Sec’y, Agency of Natural Res. v. Irish, 169 Vt. 407, 413-14, (Vt. 1999) (upholding the presumption that the wetlands identified on the maps were significant and subject to the requirements of the Vermont Wetland Rules).
and alterations to the VSWI Maps constituted rulemaking and, therefore, needed to follow the formal procedures for rulemaking set forth in the Vermont Administrative Procedures Act.\textsuperscript{112} The practical effect of the decision was that it was no longer practical to add or remove wetlands from the VSWI Maps.

The \textit{Bomoseen} decision prompted the Natural Resources Board to look into whether it would continue to make sense to rely on the VSWI Maps when determining if it had regulatory jurisdiction over wetlands. Following preliminary research that supported a new approach, the Board opened an investigative docket in 2006 that proposed improving the efficiency and fairness of the VWR by taking regulatory jurisdiction over wetlands as they exist in the field, rather than relying on wetland inventory maps. ANR staff welcomed the initiative until the political leadership at the top of the Agency caught wind of it, expressed its vehement opposition to the proposed rules, and muted staff support. The Commissioners of all three ANR Departments (Environmental Conservation; Fish & Wildlife; and Forests, Parks, & Recreation) appeared before the Board to oppose the initiative. Instead, ANR supported narrow legislation that would have obviated the \textit{Bomoseen} decision and allowed the Board to continue to remove wetlands from the VSWI Maps without going through formal rulemaking. The Republican-dominated Board backpedalled on its idea to dispense with the VSWI Maps, and meetings of a Wetlands Investigation Group (WIG) that the Board had convened to revamp the old rules dragged on.

The Panel encountered significant resistance from not only ANR, but also the Agency of Agriculture, Farms and Markets (AAFM) and certain segments of the regulated community. ANR implausibly contended that the six-person state wetlands office would need to be expanded to 90 individuals in order to accommodate the Panel’s proposal, even though wetland programs in comparable states, like New Hampshire, indicated that significant staffing increases in Vermont would not be needed.\textsuperscript{113} Of course the argument was casuistic, but ANR could not admit that it opposed the proposed rules simply because extending state regulations to additional wetlands ran contrary to the Douglas Administration’s political philosophy.

Developers and realtors argued, among other things, that it would become impossible to buy and sell, or to finance the development of real...
estate, in Vermont if the Panel looked beyond the maps to identify important wetlands in the field. In support of this argument, opponents relied on *Bianchi v. Lorenz*, 166 Vt. 555, 701 A.2d 1037 (1997), in which the Vermont Supreme Court held that non-compliance with municipal land use permits constituted a defect in marketable title to real estate. However, the argument was without merit. First, the Vermont Supreme Court had previously held in *Hunter Broadcasting, Inc. v. City of Burlington*, 164 Vt. 391, 396, 670 A.2d 836, 840 (1995), that latent violations such as filled wetlands would not constitute an encumbrance upon title. Second, the mapping system extended to unmapped wetlands contiguous to mapped wetlands, meaning that real estate could contain latent wetland violations even without moving away from jurisdictional maps. Third, the simple solution to any defects in title that the proposed rules could create would be legislation clarifying that, like the municipal permits in *Bianchi*, wetland violations did not constitute defects in marketable title.

Although the proposed amendments to the VWR would have continued to include an exemption for agricultural lands, AAFM nevertheless weighed in against them. AAFM opposed updating the VWR because the new rules would have made it harder for farmers to develop lands they owned but were not farming. Thus, a Vermont executive agency argued, in effect, that the arbitrary omission of protected wetlands from the state’s official wetlands maps and from state jurisdiction should be maintained so that those wetlands could be drained and filled in violation of federal law, without interference from state authorities. Indeed, all the arguments against modernizing the VWR assumed implicitly that Vermont should continue to facilitate the violation of federal wetlands regulations. The panel’s proposal would have simply extended state protection to wetlands already subject to

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114. Bianchi v. Lorenz, 166 Vt. 555, 556, 701 A.2d 1037 (Vt. 1997). *Bianchi* was a case involving non-compliance with municipal land use permits in which the Supreme Court held that such non-compliance constituted a defect in marketable title to real estate. It is no overstatement to say that the *Bianchi* decision caused widespread disruption in real estate conveyance and financing until a series of legislative responses provided that non-compliance with municipal permits did not violate the State’s marketable title act, 27 V.S.A. Chapter 5, Subchapter 7; see in particular VT. STAT. ANN. tit. 27, § 612. See also supra note 107 and accompanying text.

115. In the past, farmers had expressed their frustration with the state’s wetlands program, even though the principal basis for regulation of agricultural activities was a function of federal, not state, jurisdiction. For example, in 1999, then-Water Resources Board Chairman Gerald Gossens and then-Commissioner of Agriculture Leon Graves convened a “summit meeting” consisting of farmers (largely from Franklin County), representatives of ANR, EPA, the Corps of Engineers and the House and Senate Agriculture Committees to discuss regulation of agricultural wetlands and to propose changes to the then-effective VWR. Author’s notes (on file with author).
federal jurisdiction but for which federal authorities did not have the resources to actually protect.

The Democratically-dominated Legislature finally settled the matter by determining that mapping would not control jurisdiction, and instructed the Board to amend the Wetland Rules accordingly.116 As directed by the Legislature, the Water Resources Panel revised the Rules (effective August 1, 2010). The Legislature, in an effort to quell the drama around modernized Wetland Rules, included a specific statutory provision in Act 31.117 The provision stated that no encumbrance to marketable title to real estate would result from the failure to obtain or comply with a permit for activity in a wetland.118

2. Classification of Wetlands

The Vermont Wetlands Rules (VWR) classified wetlands as Class I (a wetland which is exceptional or irreplaceable in its contribution to Vermont’s natural heritage and deserving of the highest level of protection),119 Class II (a wetland which merits protection based on the extent to which it serves the ten functions and values of significant wetlands set forth in the statute),120 or Class III (a wetland which is neither Class I or II, and which is insignificant and essentially unregulated).121

In the revised VWRs, the three-level classification system was preserved. However, the process by which wetlands are classified was changed dramatically. The VSWI are no longer the primary basis for jurisdiction but now serve an advisory function.122 In a departure from the prior practice of classifying wetlands through a rulemaking process by the Water Resources Board or Panel, the VWRs now provide that Class II and Class III wetlands are classified as such through a determination process by the Secretary of ANR.123 Class I wetlands are established through formal rulemaking conducted by the Water Resources Panel.124

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117. VT. STAT. ANN. tit. 27, § 615.
118. Id.
120. Id.
3. Wetland Permitting

Another major change to the VWRs was the replacement of the previous use of Conditional Use Determinations (CUDs) by ANR with a permit system similar to other natural resource regulatory programs. The CUD was a promise not to enforce violations of the Wetland Rules provided the owner or operator followed all the conditions set forth in the CUD. The original Wetland Rules used CUDs instead of permitting because, in the face of intense political controversy over wetland regulation, the Legislature did not provide for a permitting system when it initially authorized ANR and the Water Resources Board to regulate wetlands. Although a CUD had the same effect as a permit, Vermont culture had evolved enough since the state’s first pass at wetland protection in 1990 to enable the Legislature to dispense with this semantic distinction in Act 31 and to simply call a permit a permit. The new permits are more comprehensive, require greater levels of technical information, and are generally more reliant on professional wetlands consultants.

Not unlike the stormwater permit system, the VWRs now provide for both individual and general permits.\footnote{Id. at § 9.5(b).} Individual permits may be issued by the Secretary in connection with activities in Class I and Class II wetlands, although any activity permitted in a Class I wetland must be based upon a showing that such activity “meet[s] a compelling public need to protect public health or safety.”\footnote{Id. at § 9.7(a)(4).} General permits are limited to Class II wetlands. The essential criteria for issuance of a general permit are that the activities authorized by the permit will comply with the VWRs and will have “no undue adverse effect on protected functions and values.”\footnote{Id. at § 9.5(b).} In solidarity with the federal wetland program, the VWRs continue to follow the familiar sequence of avoid, minimize, and mitigate (or compensate) to determine whether a proposed impact will have an undue adverse effect.\footnote{Vermont Agency of Natural Resources, Department of Environmental Conservation, Vermont Wetland General Permit (3-9025) (2011), available at http://www.vtwaterquality.org/wetlands/docs/wl_gp.pdf.} ANR issued the first Wetland General Permit on May 2, 2011.\footnote{Id. at § 9.5(b).}
IV. THE WAY FORWARD

In debates over environmental issues in Vermont, interest groups arguing against environmental cleanup frequently ask why Vermont always has to be first, and then characterize Vermont as hostile to business. More than once, Vermont has been first. Vermont spearheaded statewide operational stormwater permitting in the 1970s. And, as noted above, the Vermont Water Resources Board decided a string of cases that led the nation in stormwater management.

But the argument about what Vermont is doing to manage water pollution compared to other states is mostly pointless. For one thing, Vermont is not always first. Douglas Administration officials seriously discussed abandoning to EPA Vermont’s delegation to administer and enforce the Clean Water Act. Vermont was the last state in the nation to implement the federal multi-sector permit for stormwater runoff from industrial sites. And Vermont lagged behind other regions in permitting municipal separate storm sewer systems (MS4s). While Vermont’s state stormwater system is unique, many other jurisdictions regulate stormwater in their own way, for example, by municipal ordinance or through the MS4 permitting process. Moreover, as detailed above, Vermont has often ignored or mismanaged its environmental laws. The Water Resources Board issued a series of cutting-edge decisions on stormwater law because insightful environmental groups appealed important violations of the law on the part of ANR.

Vermont does need to be mindful of its regulatory climate. And Vermont can, and should, look to other states for lessons learned. The important point, however, is not what Vermont may be doing to protect its environment compared to other jurisdictions, but what Vermont needs to do to manage its environment responsibly.

Can Vermont move beyond green rhetoric and project funding to pollutant budgeting and environmental and financial accountability? Doing so will not be easy or cheap. The Chesapeake Bay, for example, is just about lost, in spite of massive efforts to save it. This section looks at how the Third Way can be replaced by a Way Forward.


The argument about water pollution control is no longer really as much about law or science as it is about societal values. There is serious concern about whether the people of Vermont, as well as those of other states, will actually be willing to do what is required to reverse water pollution trends. The human brain is not especially good at planning for long-term consequences, and people in general are not particularly adept at recognizing their own roles in contributing to problems resulting from multiple sources. The financial and regulatory burden required to curb water pollution has already been enormous, and a serious effort to manage stormwater will only make this burden heavier.

When Tropical Storm Irene deluged Vermont in late August, 2011, the damage to highways and railroads, not to mention private property, ran into the hundreds of millions of dollars. Bridges and culverts were destroyed, railroads were washed out, and miles of highways collapsed into rivers and streams. Entire communities were cut off, with no way in or out. To meet the emergency, regulatory agencies suspended permitting altogether or followed streamlined emergency permitting procedures, which sometimes involved regulatory approval by telephone.

The speed and efficiency with which public and private transportation workers repaired the damage before the onset of winter was nothing short of heroic. And as Vermonters have reflected on the storm and its aftermath, one of the big takeaways has been how much faster, less expensive, and less frustrating it is to get work done without environmental regulations. In the aftermath of Irene, workers repaired or replaced transportation infrastructure in a matter of months, when the same projects would have been locked up in permitting for years or even decades under normal circumstances. It is possible that, in some instances, repair or reconstruction may have overreached and resulted in unnecessary dredging, armoring, or straightening of rivers and streams in the absence of regulatory oversight.
Nevertheless, Irene served to highlight the burdens of environmental regulation.  

Vermonters might decide that it is not worth the money or the perceived loss of individual freedom to make Chittenden County’s urbanized streams fishable and swimmable. That may be a legitimate debate. Under the Clean Water Act, however, this debate is supposed to happen explicitly. Right now, it is not happening at all. Instead, government officials have long proclaimed their commitment to clean water while they have allowed at least certain waterways, including Lake Champlain, to languish.

If achieving the goals, or uses, of these waterways set forth by the Vermont Water Quality Standards is not worth the effort, then current law requires the state to perform a use attainability analysis, or UAA.  

The UAA would take a rigorous look at the costs and benefits of cleanup and make an explicit determination of whether or not the cleanup is worth the cost. An UAA would require government officials to formally write off waterways, and, significantly, to acknowledge having done so. So far, it has been easier politically to take Governor Douglas’ Third Way—a murky position somewhere between genuine cleanup and official surrender—and show the people all the government is doing to address water pollution while the state’s water resources continue to suffer under unsustainable loads of stormwater runoff. One is reminded of Vermont’s Republican U.S. Senator, George D. Aiken, who famously advised President Nixon that the way to end the Vietnam war was to simply “declare victory and go home.”

While Vermont could conceivably write off some of its urbanized streams, and doing so might be within the realm of reason, the tragedy of abandoning Lake Champlain—or even parts of it—to excessive loads of phosphorous would most likely prove unpalatable to most Vermonters. So, with regard to Lake Champlain, Vermont has two choices. The easy way, which will not do much for the lake, will be to continue to throw lots of money at the problem, to allow the endless meetings of experts and stakeholders to carry on, and to (disingenuously) assure the public that the government is taking a balanced approach. The second choice, requiring

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greater sacrifice and greater political will than has been evident to date, is to implement and enforce a rational system of pollution budgeting.

Balance—while politically expedient—is a dangerous concept in the area of environmental protection. In establishing goals for natural resources management, balance is entirely appropriate. For example, the Vermont Water Quality Standards do not require Lake Champlain to be restored to pristine natural conditions. The legal goal is simply to reduce phosphorous loads to the point that algae is not destroying the lake’s recreational values. However, balance becomes dangerous when trying to achieve goals already established by law. Consider the following: balancing wetlands protection means that, as a practical matter, every wetland has a half-life. When a dispute arises, the state surrenders half the wetland to political pressure—a fair compromise to some. Some years later, 50% of what’s left is surrendered, and so on. Balance is the easy way to go—the course of least political resistance.

The harder approach to protecting the lake and many other impaired waters, and possibly the only one that will work, is to organize permitting and other cleanup programs around the water’s limited assimilative capacity. Stakeholders could engage in a protracted discussion of treatment techniques and site designs, including, for example: stormwater detention ponds, vegetated riparian buffers, low-impact development, and the like—with little likelihood of achieving a workable consensus. But the latest technologies will not, in themselves, clean up these waterways or ensure that the massive financial investments in cleanup will be wisely directed. The only way to know whether cleanup efforts are properly directed is to organize them around the assimilative capacity of the receiving waters. We cannot determine whether we are doing enough (or for that matter, too much) without back-calculating from the finite assimilative capacity of these waterways to determine the pollutant loads they can handle from their various watersheds. The Third Way, which represents the status quo of polluted waterways and misdirected cleanup efforts, needs to be replaced with the Way Forward, which will involve the accountability that comes with pollutant budgeting. Cleanup efforts have stalled, and will remain stalled, because the state continues to avoid creating and following a pollutant budget.

Saving Lake Champlain and other impaired water resources might not be possible without a dramatic change in the political and economic calculus. Witnessing the decline of our natural environment today may be at least loosely analogous to watching westward expansion in the United States during the Eighteenth and Nineteenth Centuries. Many people knew at the time that what was happening was very wrong on many levels, but no
one could actually stop the onslaught. Market forces were too powerful. And so it may be with Vermont’s Water Resources. These waterways have unalterable physical limits, and exceeding those limits is a case of market failure. It would be extraordinary indeed if our society found the vision to coordinate and cooperate enough to organize development around those limits. But extraordinary or not, pollutant budgeting is probably the only option for preventing the further decline of the water quality in Vermont.

The preservation of Lake Champlain and Vermont’s other streams and lakes will entail more than just increased spending of public money. It will require imposing limits (including outright prohibitions) on certain anthropogenic activities—saying “no” to economic development or expansion when they result in the introduction of pollutants beyond the receiving water’s assimilative capacity. Organizing management efforts around the needs of the natural resource, rather than the needs of dischargers, causes many people extraordinary psychological discomfort. We all live at the centers of our own universes. Asking people to start thinking about the needs of other people and natural resources, rather than their own objectives and self-interest, challenges people’s priorities in a fundamental way. Some people become angry and upset when you start speaking in these universal terms. Many people do not readily accept that water resources are not some “other,” but rather are integral parts of our common community and of the heritage we will leave for generations to come.\footnote{136 See generally, Daniel D. Dutcher et al., Connectivity with Nature as a Measure of Environmental Values, 39 ENV’T & BEHAVIOR 474, 474 (July 2007) (correlating, statistically, universalism values with environmental concern and behavior).} In any event, and as a practical matter in this context, most people simply want to know what they need to do to get a permit, and they do not like hearing “no” for an answer.

Vermont, like other jurisdictions, has reached a kind of stalemate on water pollution control. Regulatory agencies, NGOs, and businesses have locked horns. Businesses may cut regulatory corners to stay competitive, or make good faith errors in the byzantine permitting process, making any particular project vulnerable to legal challenge by environmental groups or even competitors. NGOs compete for money and social status, thereby adopting the same orientation toward power and finance that drives the problems they aim to resolve. Regulatory agencies are caught in the middle.

Researchers are discovering that providing information to the public about bigger-than-self issues—like the pollution of public water resources—typically fails to influence those whose worldviews conflict with the information provided. To break the stalemate over the
environment, the task ahead may be to learn how to discuss—and influence—the competing values that lead to or away from concern about the environment and willingness to support coordinated environmental protection programs. 137 To get ahead of water pollution, Vermonters may need to engage in this discussion of how our deep frameworks foster or impede our willingness to sustainably manage our natural resources.

Real courage will be required to reverse water pollution trends in Vermont. Political philosophy matters. In its more extreme forms, the conservative anti-government philosophy has been bad for the environment at the national level, and it has been bad for the environment in Vermont. For Vermont’s water resources to have any hope, Vermonters, as a whole, need to embrace a genuine environmental ethic, and must believe that government can and must act on behalf of the people to protect the state’s water resources for the common good. To provide just one rather glaring example of our failure to accept limits, we have spent over $100 million 138 on the effort to cleanup Lake Champlain, but we still allow cows in streams. Realistically, we cannot have large numbers of cows defecating in streams and trampling streambeds and banks and expect to have clean water.

Fencing livestock out of riparian zones should be low hanging fruit in the effort to reverse water pollution—a the top priority. Farmers may complain that protecting riparian zones will take valuable land out of production and may require the construction of alternative sources to water animals. Vermont will need to decide whether it can afford to cover all or part of these losses, let more farms go out of business, or leave the farmers alone and live with the polluted runoff. It seems very unlikely that Vermont can continue to allow animals to wander in and out of riparian zones and enjoy clean water at the same time. Other examples of these kinds of tradeoffs, involving agricultural, residential, and commercial lands, abound.

Environmental laws need to be realistic in scope and fairly and effectively administered and enforced. One way to implement TMDLs fairly is through stormwater utilities. Stormwater utilities, which can be operated at the municipal or the state level, can assess fees against property owners based on the amount of impervious surface, or effective impervious surface, they own, and then apply these fees to implement TMDLs on a watershed-wide basis. In this manner, the costs of cleanup are distributed equitably, according to the extent to which property owners contribute to

138. Kathryn Flagg, supra note 35.
the problem, and cleanup responsibilities do not impact landowners disproportionately.

Tools and techniques, however, will not be enough to bring water pollution under control. The public must embrace the public policy goals that underlie water pollution control laws and demand their application. Existing water pollution control laws are not perfect, but they are generally pretty good. The problem is that too often the government does not fairly enforce or apply them. The history of the Clean Water Act, both in Vermont and across the nation, could be written as the story of the lawsuits that government agencies have fought and lost. In Vermont, as elsewhere, the idea of enforcement discretion has evolved from a way to implement sensible priorities to a way of simply ignoring inconvenient environmental laws. Qualified, fair-minded officials need to look at these laws in a straightforward way, take these laws to mean what they say, and do what these laws demand. Distorted, politically motivated legal interpretations papered over with misleading media sound-bites might buy political capital, but, ultimately, they discredit the government and destroy its ability to make the law work. To make matters worse, gaming the system in favor of special interests makes the law more confusing and less predictable, inevitably gumming up the permitting process through lawsuits and legislative battles. If Vermonters truly want clean water, then they need to let their water pollution control laws work.

At an absolute minimum and as a first step, Vermont has to stop working against EPA and the environmental advocacy community, and instead work collaboratively to restore and maintain the quality of Vermont’s waters. The responsibility for protecting Vermont’s water resources cannot be stove-piped at ANR and other government offices. Rather, a genuine environmental ethic needs to be woven into the fabric of government as a whole. ANR needs to be adequately funded, and the Agency needs to work cooperatively with other executive agencies and the widest range of stakeholders.

Restoring and maintaining Vermont’s water resources will require a strong planning component. Act 250 and municipal planning can be used to implement TMDLs. Local, regional, and statewide planning can, and must, consider the assimilative capacity of receiving and downstream waterways. The development community needs to be realistically engaged in the design, funding, and implementation of cleanup plans. The prevailing approach from commercial interests of demanding the government to “just tell us what to do” is not enough. If a TMDL limits mass-loading into, or from, a particular watershed, then development interests need to be engaged in the discussion of how those limits will be achieved and sustained. If you
give one group some slack, then you need to take it up from another in order to respect loading limits. The development community needs to move from being victims of (and opponents of) environmental laws, to being stakeholders actively engaged in sorting out how pollutant loads will be distributed across landscapes and among property owners. The greatest environmental challenges in Vermont involve the interrelated issues of land use and water quality. The connection between land use planning and water quality protection has been much discussed, but the waterways cannot survive unless planning and pollution control work in concert.

It may be tempting to place the responsibility for reversing water pollution on our elected officials and their appointees, or even agency staff. However, no law can be enforced beyond a point that the people will accept. Natural resource management agencies in Vermont and elsewhere are compelled to be dysfunctional. These agencies function, or fail to function, not because of any institutional inability to do their jobs. State and federal regulatory agencies are staffed by capable and committed individuals who are given a difficult job to do, with limited resources, and are then beset with mixed messages from the public and their political representatives. Agency staff operate in a politically-driven environment characterized by media sound bites, endless meetings, and glacial progress. Zealous agency officials can make some lasting impacts, but sooner or later, if they push too far, they invariably provoke a backlash.

The causes of water pollution are anthropogenic and so are the solutions. Managing waterways is ultimately about managing people. Law and science are tools. People need to put those tools to work—when they are ready.

CONCLUSION

Vermont faces significant and worsening water pollution. In Vermont, as elsewhere, great strides were made in water pollution control in the 1970s and 1980s as the Clean Water Act subjected sewage and industrial wastewater to technological controls. But those gains are now being outstripped by losses brought by stormwater runoff from cities and towns, farms, and ski resorts. Numerous Vermont streams are impaired by stormwater runoff, and segments of Lake Champlain suffer from persistent algae blooms caused by excessive phosphorous loads pouring in from the surrounding landscape.

While Vermont and the federal government have poured millions of taxpayer dollars into the state’s water pollution problems, these efforts
cannot succeed without establishing pollutant budgets for the state’s impaired waters and managing them according to their limited capacity to assimilate stormwater. To date, Vermont has talked a greener game than it has played. Government officials can point to all the efforts they have made to curb water pollution in Vermont, but those efforts will not realize results without the organizational umbrella of pollutant budgeting. Trying really hard will not clean up Vermont’s waterways. Instead, allowable loads from watersheds and sub-watersheds must be established by back-calculating from the assimilative capacity of the receiving waters. Otherwise, it will be impossible to tell whether efforts made in a particular area are too much or not enough, and whether the gains from the application of imperfect treatment technologies and site designs to existing and new development are outstripping the losses from new and increased discharges.

For a generation, government officials have been telling Vermonters what they have wanted to hear—that the state is working to bring Vermont’s waters back, but that, at the same time, government regulation and planning will not stand in the way of anyone’s economic interest. To prevent Vermont’s waterways from continuing to slip away—to reverse water pollution trends—this Third Way needs to be replaced with the Way Forward. Instead of being lulled into thinking they can have everything, people need to accept the hard truths about the state’s water pollution problems, and weigh the actions that will be needed to turn them around. Only then can the people of Vermont decide whether they want to bear the burden of resource protection, or to continue to let the condition of the state’s public waters decline.
THE HARD REALITY OF BREAKING UP: THE GLOBAL TRANSBOUNDARY MOVEMENT OF OCEAN VESSEL DEMOLITION AND WASTE

Holly H. Hillyer

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INTRODUCTION

More than 80% of international trade in goods by volume is transported by ships.1 In 1960, the global inventory of ocean-going vessels was about 15,000, and, by 2008, that number had soared to more than 97,000.2 These vessels include oil tankers, bulk carriers, general cargo carriers, container ships, and passenger vessels.3

Like everything in today’s society, once a vessel is no longer useful or repairable, it is sent off to the local junkyard.4 But what or where is the

2. Id. at 251.
3. Id. at 250.
4. See id. (discussing how ships are often demolished in developing countries).
local junkyard for ocean-going vessels? What does one do with an old ship? The answer to these questions is most likely a quiet bay with a shallow sandy beach in a developing country for “shipbreaking,” a process in which a ship is dismantled into its valued components.5

A typical ship can provide tons of steel and iron, useful heavy equipment such as cranes and winches, or electronic equipment—all of which are potentially valued commodities. However, there are also a myriad of other less desirable “waste” materials generated during the dismantling process. These include hazardous wastes such as toxic paints, asbestos, polychlorinated organic compounds (PCBs), lead and mercury, radioactive wastes, electronic wastes, and trash such as furniture, wood, and plastics.6

While most of the western world has strict regulations on the management of the shipbreaking process to ensure proper handling of the waste materials generated, most developing countries lack or fail to adequately enforce such regulations.7 The reasons for this disparity vary; however, the most common reason is the developing country’s need for the resources and economic value from the materials yielded by the ships.8 Unfortunately, the real costs for the lack of effective regulations are borne by the cheap local labor, uninformed communities, and the environment.9

This paper will address the growing issue of shipbreaking, its impacts on developing nations and the global environment, and the critical need for improved international laws.

I. IS IT SHIP RECYCLING OR SHIPBREAKING: WHAT’S IN A NAME?

Almost every part of a ship can be reused or recycled in theory, which would make ship recycling the accurate term for the dismantling process. Hence, ship recycling should be a vital element in any sustainable development strategy, since it provides employment, raw materials, and economic benefits.10 In 2007, even the Baltic and International Maritime Council (BIMCO), one of the world’s largest private shipping non-governmental organizations, stated that ship recycling is a green industry

5. Id.
7. See id. at 250 (describing lack of enforcement in India).
8. Id.
9. Id.
10. TONY GEORGE PUTHUCHERRIL, FROM SHIPBREAKING TO SUSTAINABLE SHIP RECYCLING, EVOLUTION OF A LEGAL REGIME 15 (2010).
and the most environmentally friendly process of disposing of ships, if
managed properly.\textsuperscript{11}

It is this last proviso—if managed properly—that has proven to be the
challenge. Starting with the ship building process, the construction of ships
does not take into account the final dismantling procedure.\textsuperscript{12} Hence, a toxic
cocktail of hazardous, carcinogenic, or environmentally harmful materials
have often been used in the construction of these vessels, especially those
built between the 1960s and the 1980s.\textsuperscript{13} It is these materials that make ship
recycling problematic and raise the question of whether the process is truly
ship recycling or simply shipbreaking. By and far, the ability to separate the
desired resources from the hazardous elements has proven to be a challenge
because the segregation is very labor intensive and can be dangerous or
unsafe for workers.\textsuperscript{14} Consequently, most ships are broken down into their
usable components only, leaving the hazardous materials to take care of
themselves—resulting in releases of these materials into the environment
and exposure to the workers and the host communities.\textsuperscript{15} Thus, in most
developing countries, the process is better labeled shipbreaking, since it is
strictly the act by which a ship is rendered into its reusable components.

\section*{II. THE SHIPBREAKING PROCESS}

Shipbreaking is the process of dismantling an obsolete ocean-going
vessel for scrap and reusable parts, while disposing of the remaining
unwanted materials.\textsuperscript{16} The process is currently performed using one of two
approaches—the dry dock method or the beaching method.\textsuperscript{17} The dry dock
method is the primary process by which most western countries scrap sea
vessels. It involves hoisting the ship into a dry dock or controlled quayside
facility where any pollutants can be captured and contained.\textsuperscript{18} Once the ship
is docked, it is broken into large pieces that are then sent to other areas for
further processing.\textsuperscript{19} The beaching method is used throughout the

\begin{thebibliography}{99}
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\bibitem{11} Id. at 21.
\bibitem{12} Id. at 15.
\bibitem{13} Id.
\bibitem{14} See id. (indicating that asbestos, for example, poses a health risk for ship recyclers).
\bibitem{15} See id. at 29–38 (describing the shipbreaking process in several developing countries).
\bibitem{16} Id. at 1.
\bibitem{17} Duncan Graham-Rowe, \textit{Breaking Up is Hard to Do}, 429 \textit{Nature} 800, 800 (2004).
\bibitem{18} Madhur Singh, \textit{Maritime Affairs: South Asian Shipbreakers Plan Joint Effort to Oppose
International Recycling Convention}, 42 \textit{Daily Env't Rep.} A-4 (2010); Graham-Rowe, supra note 17 at
800.
\bibitem{19} Id.
\end{thebibliography}
developing world, most extensively in India and Asia. This process involves literally beaching the vessel under its own power at high tide. As the tide recedes, the ship is laid down on its flat bottom on the exposed beach and then the manual process of demolition begins. Either process includes a wide range of activities, from removing the machinery and gutting the ship, to the final cutting down of the actual structure of the vessel.

The shipbreaking process was first developed in the United States (US), Great Britain, and Japan following World War II in response to the urgent need for steel for the booming post-war economy and as a way to recycle the large volume of war-damaged ships now requiring disposal. Over the following decades, global shipping volume increased from 15,000 ships existing globally in 1960 to more than 97,000 in 2008, which, in turn, fueled significant growth in the demand for shipbreaking. The types of vessels sent for demolition vary from oil tankers, bulk carriers, general cargo, and container ships to passenger ships. Additionally, during this current time of economic recession and international trade stagnation, there is an overcapacity in the freight market and, therefore, more ships are sent to the scrap yard.

The trend to dismantle ships abroad does not appear to be abating; in fact, there is currently an increasing number of ships which will be destined for the world’s shipbreaking yards. In April 2001, the International Maritime Organization (IMO) and the European Union (EU) promulgated regulations requiring all single-hulled tankers to be retrofitted or replaced with ships containing two hulls by 2015. However, this original timeline was accelerated following the destruction of a single-hull oil tanker off the

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20. Graham-Rowe, supra note 17, at 801.
21. Demaria, supra note 1, at 252.
22. Id.
23. Id. at 252–53.
24. Id. at 252.
25. Id. at 251.
26. Id. at 250.
28. Graham-Rowe, supra note 17, at 801.
29. Id. at 800.
shore of Spain in 2002\textsuperscript{30}. Since that disastrous event, some vessel types have been required to begin the replacement process as early as 2005.\textsuperscript{31}

Today, companies sell their unwanted ships at the best price for dismantling through brokers operating in cities such as London, Dubai, Singapore, and Hamburg.\textsuperscript{32} Sea vessels are sold by the ton at a price ranging from 100 to 400 U.S. dollars, depending on the markets for the component materials and the type of vessel.\textsuperscript{33} The developing nations in South Asia’s shipyards are the main destination for demolition.\textsuperscript{34} In 2009, of the 1,006 vessels sent for demolition, 435 were sent to India (43%), 214 to Bangladesh (21%), 173 to China (17%), 87 to Pakistan (9%), and 42 to Turkey (4%), leaving 6% for the remaining shipyards.\textsuperscript{35}

Alang-Sosiya Ship Breaking Yard (ASSBY) in India and Chittagong in Bangladesh are the world’s biggest shipbreaking/recycling yards, with China in close pursuit.\textsuperscript{36} Ships arrive at these shipyards mostly from Europe, Japan, and North America.\textsuperscript{37}

III. WHO ARE THE PLAYERS IN THE SHIPBREAKING BUSINESS?

A. The Developed Countries: United States, European Union, Turkey, and the Organization for Economic Co-operation and Development (OECD)

30 industrialized countries comprise and are committed to the principles of the OECD, including some of the former leading shipbreakers from Europe and Asia.\textsuperscript{38} Belgium, Italy, Britain, Spain, Denmark, the Netherlands, the U.S., and Canada maintain “green” recycling facilities.\textsuperscript{39} The EU deconstructs approximately 25 to 50 ships per year, with Belgium, Italy, and the Netherlands being the largest ship-dismantling yards, combined with a multitude of other smaller facilities located in the EU.\textsuperscript{40} In

\textsuperscript{30} Id.
\textsuperscript{31} Id.
\textsuperscript{32} Demaria, \textit{supra} note 1, at 252.
\textsuperscript{33} Id.
\textsuperscript{34} Id.
\textsuperscript{35} Id.
\textsuperscript{36} Id. at 254.
\textsuperscript{37} Id.
\textsuperscript{38} PUTHUCHERRIL, \textit{supra} note 10, at 40.
\textsuperscript{39} Id. at 40–41.
addition, Turkey has 20 shipbreaking yards on the shores of Aliaga, which have the capacity to dismantle 100 ships per year.41

However, despite all the regulatory framework and “green” ship recycling facilities located within the OECD, the fact remains that OECD countries are the primary exporters of toxic ships to China and the Indian subcontinent.42 Turkey and OECD countries have struggled in attracting obsolete ships for dismantling because the cost of regulatory oversight reduces the ability of these facilities to offer the attractive scrap metal prices that the Indian subcontinent can offer.43 Consequently, Turkey, the U.S., and the OECD countries have become an unattractive option for ship demolition.44

B. The Developing Countries: Bangladesh, Pakistan, India, and China

1. Bangladesh

Bangladesh relies on the dismantling of ships as its only source of iron ore resources in the country; shipbreaking provides approximately 80% of the country’s steel needs.45 The center of the Bangladesh shipbreaking industry lies in the Sitakund area of Chittagong, which has 30 shipbreaking yards.46 In December of 2010, the World Bank reported widespread contamination of Chittagong’s beaches with lead, mercury, and oil.47

2. Pakistan

Pakistan appears to be the first country in the Asian continent to begin dismantling ships without a complementarily established ship building industry.48 However, even though Pakistan’s shipyards maintain the cheapest labor force in Asia, the shipbreaking industry is declining due to rising scrap metal prices and high import duties imposed by Pakistan.49

41. Id.
42. PUTHUCHERRIL, supra note 10, at 41.
43. Id. at 43.
44. See id. (asserting that member countries of the OECD are generally unattractive options for ship recycling).
45. Id. at 28.
46. Id.
48. PUTHUCHERRIL, supra note 10, at 29.
49. Id. at 30.
3. India

India’s shipbreaking industry is a leader in the developing world. India’s largest shipyard, Alang-Sosiya, has, at times, employed approximately 35,000 workers and dismantled about one ship per day.50

4. China

In 1993, almost half of all sea vessels were scrapped on the beaches of China.51 However, China’s industry was soon eclipsed by other countries in the Asian subcontinent.52 Even though China’s shipbreaking practices are considered superior to the rest of Asia as a significantly green recycling process,53 this notoriety has done little to bolster China’s shipbreaking business.

IV. ALANG-SOSIYA SHIP BREAKING YARD: A LOOK AT THE SHIPBREAKING YARD

ASSBY presents a classic case for the study of the shipbreaking process and serves as a striking example of the issues of shipbreaking. At one time synonymous with shipbreaking, ASSBY is capable of employing approximately 35,000 workers, breaking almost one ship per day.54 The shipyard is located on ten kilometers of Indian coastline on the western coast of the Gulf of Cambay in the Arabian Sea.55 This shipyard exclusively employs the shipbreaking beaching method.56 The workers typically use simple Liquid Propane Gas and oxygen torches to cut the ship into pieces, along with their bare hands.57 The entire dismantling process takes place directly on the beach in designated lots.58 In all, there are 192 shipbreaking lots at ASSBY, each with a length of 50–240 meters and a width of 30–120

50. Id. at 53.
51. Id. at 38.
52. See id. (stating that India now has a larger shipbreaking industry).
53. PUTHUCHERRIL, supra note 10, at 38.
54. Id. at 53.
55. Demaria, supra note 1, at 252.
56. Id.
57. Id.
58. Id.
Machinery and heavy equipment (engines, compressors, generators, and boilers) and various components (navigation equipment, furniture, electrical cables, and utensils) are removed from the vessels and sold for reuse to traders directly on the beach lots. These types of operations do not require any infrastructure or technology because they are mostly labor intensive and the ships themselves provide the moving cranes and motorized winches needed for the practice. Usually, it takes three to six months for an average ship (15,000 tons) to be dismantled using approximately 150–300 workers at various stages of the process. The volumes of iron and steel recovered at ASSBY are enormous—providing for an estimated ten to 15 percent of India’s total steel production. Environmental, safety, and health issues do not seem to be part of the overall costs, even though the process is plagued by major safety, health, and environmental challenges.

Between 1982 and 1983, only five ships were scrapped at ASSBY, but between 2001 and 2002 that number had rocketed to 333. Surprisingly, the numbers decreased between 2005 and 2006 to only 101 ships. This decrease was largely driven by an increase in freight shipping rates. When the freight rates increase, it becomes more economical to maintain and operate older ships than disposing of them for scrap—as the money that can be made operating an older ship, with its additional upkeep and maintenance, is less than the money the ship is bringing in from the high freight shipping costs. Consequently, a fewer number of ships were scrapped at ASSBY from 2005 to 2006. However, overall, the number of ships dismantled at ASSBY has continued to climb since the yard began operations in the early 1980s, with an annual output averaging more than 100 ships over the past decade. These numbers are expected to increase further in the near future due to the global recession causing ship owners to

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60. Demaria, supra note 1, at 252–53.
61. Id. at 253.
62. Id.
63. Sonak, supra note 55.
64. Demaria, supra note 1, at 250, 253.
66. Id.
67. Id. Demaria, supra note 1, at 255.
68. SARRAF, supra note 45, at 3, 12–13.
69. Id. at 14.
either downsize or go out of business, coupled with the aforementioned recent changes in the IMO single-hull retrofit requirements.70

V. THE WASTES OF SHIPBREAKING

In general, ships contain a variety of non-hazardous, hazardous, and even radioactive materials that may or may not be reused or recycled.71 These wastes may be present in the ship’s onboard equipment (built in) or incorporated into the physical structure of the ship itself.72

Non-hazardous materials may include items such as: furniture, scrap wood, plastics, paper, rubber, glass wool, sponge, PVC pipes, metals, and some oils.73 Hazardous materials may be present in such items as: oils, heavy metals contained in navigational equipment and switches, electronics or designed construction components of the ship itself, and anti-fouling agent hull paints designed to repel or kill barnacles or other sea life that attempt to attach to the vessel.74 Other types of hazardous materials include such items as PCBs, which can be present in insulation of electrical cables, or asbestos, which is used as a fire retardant in older vessels.75 Radioactive materials can also be present in the form of fire detection equipment, which has been documented to contain the radioactive element Americium-241.76 Additional waste types include bilge and ballast waters which can contain oil, residuals from past cargos, heavy metals, or foreign/non-native animal or plant species (alien species).77 On average, the overall waste generated by the shipbreaking process is between one-half of a percent to ten percent of the ship’s total weight, and most of that may be comprised of hazardous materials.78

International regulations, such as the 1989 Basel Convention and Protocol, the IMO, and the impending Hong Kong Convention (HKC),

70. Id. at 9, 15.
71. Demaria, supra note 1, at 253.
72. Id.
73. Id.
74. Graham-Rowe, supra note 17, at 800; see id. at 252 (listing dismantled ship components).
75. Graham-Rowe, supra note 17, at 800.
76. Demaria, supra note 1, at 258.
77. PUTUCHERRIL, supra note 10, at 18. Alien species are those plants or animals that are not native to the environment to which they have been transported. Id. Transportation of these species may occur either intentionally or accidentally. Id. In the case of shipbreaking, these alien species are unintentionally transported in the water within the ship from their native environment and deposited in a new non-native environment when the water is released. Id.
78. Demaria, supra note 1, at 253.
require ships destined for dismantling to be certified as clean of removable hazardous wastes and require documentation of any hazardous wastes remaining on the ship. However, many ships still arrive at shipbreaking yards in developing nations containing vast amounts of toxic, environmentally persistent waste materials, which will potentially be released into the environment or exposed to the workers and surrounding communities.

<table>
<thead>
<tr>
<th>Weight %</th>
<th>Value %</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-85</td>
<td>65</td>
</tr>
<tr>
<td>10-15</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>0.50</td>
</tr>
<tr>
<td>2</td>
<td>0.50</td>
</tr>
<tr>
<td>5-10</td>
<td>0</td>
</tr>
</tbody>
</table>

Average Components Obtained from Dismantle Ocean Going Vessels
Upadhaya 2002 – Interviews with Shipbreakers

<table>
<thead>
<tr>
<th>Weight %</th>
<th>Value %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-rollable ferrous scrap and iron plates</td>
<td>75-85</td>
</tr>
<tr>
<td>Reconditioned machinery</td>
<td>10-15</td>
</tr>
<tr>
<td>Remelting scrap</td>
<td>3</td>
</tr>
<tr>
<td>Non-ferrous metal</td>
<td>1</td>
</tr>
<tr>
<td>Furnace oils and other oils</td>
<td>2</td>
</tr>
<tr>
<td>Wood and Furniture</td>
<td>2</td>
</tr>
<tr>
<td>Burning, cutting losses, and waste materials</td>
<td>5-10</td>
</tr>
</tbody>
</table>

Hazardous Material Present on a Typical Ocean Going Vessel to be Dismantled
Bangladesh

Reusable Liquid Organics | 675,000 tons

80. Sonak, supra note 55, at 155.
81. Demaria, supra note 1, at 255.
82. Sarraf, supra note 45, at 32.
The Hard Reality of Breaking Up

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCBs</td>
<td>240,000 tons</td>
</tr>
<tr>
<td>Ozone Depleting Substances (such as CFCs)</td>
<td>210,000 tons</td>
</tr>
<tr>
<td>Asbestos</td>
<td>79,000 tons</td>
</tr>
<tr>
<td>Paints containing PCBs, heavy metals, or Tributyltin TBT</td>
<td>69,200 tons</td>
</tr>
<tr>
<td>Acid Waste Liquids</td>
<td>775 tons</td>
</tr>
<tr>
<td>Heavy metal (such as lead, or mercury)</td>
<td>687 tons</td>
</tr>
<tr>
<td>Waste Liquids</td>
<td>1,978,000 cubic meters</td>
</tr>
<tr>
<td>Sewage</td>
<td>107,000 cubic meters</td>
</tr>
</tbody>
</table>

Some estimates indicate that, between 2006 and 2015, approximately 5.5 million tons of these potentially environmentally harmful materials will end up in shipbreaking yards around the world. Therefore, the primary concern regarding the shipbreaking process involves the management and/or disposal of the hazardous materials associated with these ships during their demolition.

There are three primary methods of disposal for hazardous wastes during the shipbreaking. The first is decontamination of the ship prior to export for demolition; however, this is costly to the ship owner and requires expertise and technology. A second disposal option is to implement environmentally protective management at the site of dismantling. This is the option recommended by the International Convention for the Safe and Environmentally Sound Recycling of Ships; however, this may be costly for the shipyard. The third main disposal method is simply open dumping of the hazardous waste into the environment without any care to its containment or management. Unfortunately, most of the developing world’s ship yards use the third method. Essentially, wastes that cannot be recycled, re-used, or sold—whether hazardous or not—are disposed of by

83. PUTHUCHERRIL, supra note 10, at 18–19.
84. Demaria, supra note 1, at 253.
85. Id. at 254.
86. Id.
87. Id.
being openly burned on the beach of the shipbreaking lot, dumped directly into the ocean at the lot, or dumped during the night in the surrounding villages or other industrial areas in the region.\textsuperscript{88}

VI. THE TOLL OF SHIPBREAKING

\textit{A. Human, Species, and Environmental Costs}

1. Workers and Locals

The cost to both workers and communities in shipbreaking areas is immense. It has been estimated that, depending on the number of ships being broken, between 5,000 and 50,000 migrant workers depend on this industry for survival for a daily wage of three to seven U.S. dollars.\textsuperscript{89} According to the United Nations’ International Labor Organization, shipbreaking is now considered one of the world’s most dangerous occupations.\textsuperscript{90} Laborers receive little training, no protective clothing or equipment, and are constantly exposed to hazardous materials and/or occupational dangers, such as suffocation, falling debris and metal, fire, explosion, falls, and electrocution.\textsuperscript{91} In one example, a National Institute of Occupational Health (NIOH) study reported that the chest X-ray examination of 94 workers at ASSBY showed 15 individuals (16\%) with clinical signs consistent with asbestosis.\textsuperscript{92}

Shipbreaking workers typically live in shared shanties close to the shipyard with no running water, electricity, or sanitation.\textsuperscript{93} In addition to exposure to hazardous waste at work, workers are also continually exposed to pollutants even when not at work. These exposures include: high levels of contamination in their local living areas near the shipyard; tainted air from constantly burning waste pyres; drinking water that is frequently fouled by the lack of sanitation and hazardous waste contamination; and highly contaminated fish from polluted waters that workers catch and consume.\textsuperscript{94}

\begin{itemize}
  \item \textsuperscript{88} Id.
  \item \textsuperscript{89} Id. at 255.
  \item \textsuperscript{90} Graham-Rowe, \textit{supra} note 17, at 801.
  \item \textsuperscript{91} Id.
  \item \textsuperscript{92} Demaria, \textit{supra} note 1, at 255.
  \item \textsuperscript{93} Id.
  \item \textsuperscript{94} Id.
\end{itemize}
Workers who are sickened or injured can seek help at the local clinic, but most either work until they are killed or are sometimes dumped at sea to drown at the uncaring hand of their employers. They live by the adage of “one ship, one death,” or “one death per day.”

The local peoples and communities are also impacted by the pollution, either by the dumping of waste from the shipbreaking process in the surrounding areas, which are used for grazing livestock and farming, or from the continual burning of wastes on the beach. Villagers often report respiratory and skin problems, kidney disease, livestock death from eating waste, as well as a decrease in the quantity and size of the crops produced in the area.

2. Species

The local fish populations are also impacted—a serious concern since fish are a main dietary staple for the local populations in shipbreaking areas. Fishermen consistently report that, since the shipbreaking activities began in their communities, the quantity, variety, and size of the fish have decreased. Some species have disappeared totally and/or their flavor has become more metallic. Fish studies have shown bioaccumulation of high levels of the toxin tributyltin, which is derived from the anti-fouling paints present on the ships. Despite the presence of tributyltin at levels much greater than would be suitable for human consumption, these fish are dried and sold abroad, but they are not only eaten by the local villagers and workers. Furthermore, some species of contaminated fish in shipbreaking areas are migratory, which could potentially be caught and consumed by distant populations elsewhere, unaware of the potential toxins carried in these fish.

95. Id. See Will Englund & Gary Cohn, A Third World Dump for America’s Ships?, THE BALTIMORE SUN, Dec. 9, 1997 (suggesting injured workers have option to seek medical care at local clinics).

96. Demaria, supra note 1, at 255.

97. Id. at 256.

98. Graham-Rowe, supra note 17, at 801.

99. Demaria, supra note 1, at 256.

100. Id.

101. Id.

102. Id.

103. Id.

104. Demaria, supra note 1, at 256.
<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Village of Ghogha</th>
<th>Village of Katpar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bombay Duck</td>
<td>102,069 kg</td>
<td>93,862 kg</td>
</tr>
<tr>
<td>Hilsa</td>
<td>7,020 kg</td>
<td>0 kg</td>
</tr>
<tr>
<td>Culpd</td>
<td>1,860 kg</td>
<td>0 kg</td>
</tr>
<tr>
<td>Mullet</td>
<td>44,308 kg</td>
<td>24,809 kg</td>
</tr>
<tr>
<td>Catfish</td>
<td>21,715 kg</td>
<td>0 kg</td>
</tr>
<tr>
<td>Colmi (shrimp)</td>
<td>175,250 kg</td>
<td>909,151 kg</td>
</tr>
<tr>
<td>Medium Prawn</td>
<td>704,179 kg</td>
<td>480,121 kg</td>
</tr>
<tr>
<td>Jumbo Prawn</td>
<td>214,314 kg</td>
<td>80,400 kg</td>
</tr>
<tr>
<td>Lobster</td>
<td>87,141 kg</td>
<td>21,199 kg</td>
</tr>
<tr>
<td>Colia</td>
<td>0 kg</td>
<td>0 kg</td>
</tr>
<tr>
<td>Dohma</td>
<td>0 kg</td>
<td>0 kg</td>
</tr>
<tr>
<td>Other fish species</td>
<td>420,538 kg</td>
<td>186,427 kg</td>
</tr>
</tbody>
</table>

105. Id. at 256.
3. Environment

The broader environment in proximity to the shipbreaking areas has been significantly impacted as well. For example, the environmental stress from the shipbreaking activity at ASSBY has led to a decline in biomass as measured by the abundance and species diversity of both plants and animals. There is almost no vegetation in the intertidal zone around ASSBY. The mangroves died shortly after the shipbreaking industry arrived, and the local marine environment shows very low levels of zooplankton and phytoplankton, including a low abundance of fish eggs and larvae. It is well documented that pollutants can mix with suspended solids and travel great distances via the currents and tides to pollute areas further abroad, and, indeed, the coastline within 100 kilometers east and west of ASSBY shows traces of the pollutants as well as oils associated with the shipbreaking process. An additional assault to the local environment comes from non-native invasive species that have arrived in the ballast waters of foreign ships and that pose a threat to the native populations. The lack of sanitation for the workers, which has resulted in a pathological bacterial loading of the surrounding surface, ground and sea waters of ASSBY, has caused them to be unsafe for human use and/or consumption.

106. Id. at 254.
107. Id.
108. Susan Leach Snyder, *Living on the Edge ... Mangrove Estuaries*, 18 J. OF MARINE EDUC. 19, 19 (2002). Mangroves are areas comprised of various kinds of trees and shrubs that grow in saline coastal sediment habitats in the tropics and subtropics. *Id.* Typically, mangroves are found in estuaries and marine shorelines. *Id.* Mangroves provide an important ecosystem for algae, barnacles, oysters, sponges, shrimp, and mud lobsters as well as an intricate habitat necessary for the food web. *Id.* Mangroves have also been recognized as important sources of carbon fixation. *Id.* R.J. DUNLAP MARINE CONSERVATION PROGRAM, OCEAN AND COASTAL HABITATS 5, available at http://www.rjd.miami.edu/learning-tools/high-school (follow third link to mangroves).
110. *Id.
111. Puthucherril, *supra* note 10, at 131. During the shipbreaking process and the release of the ship’s ballast waters, alien species are unintentionally transported within the ship from their native environment and deposited in a new non-native environment wherever the water is released. *Id.* When non-native species are released into an environment that is not where the species would naturally be located, the species may not be able to survive. *Id.* However, in many instances, these non-native species are not only capable of surviving, but, without the organisms’ natural predators present, these alien species also thrive and can outcompete the local species. *Id.* Consequently, the local species may be decimated by these newcomers and may not be able to recover resulting in extinction in that environment. *Id.
112. *Id.* at 132.
VII. The Shipbreaking Regulatory Scheme: A Tangled Web

A. National Laws

Developed countries typically have an extensive regulatory framework for the proper management and disposal of various waste streams, all with the same common intent to be protective of human health and the environment. However, while each nation has laudably taken the initiative, the result has been a tangled mass of regulatory oversight that, unfortunately, does not address the shipbreaking industry as a whole in a comprehensive way. In contrast, developing countries frequently lack comprehensive environmental laws, and, if these do exist, they are often poorly enforced for various reasons stated below.

1. United States

In the U.S., there are several overlapping regulatory schemes that are under the jurisdiction of the United States Environmental Protection Agency (U.S. EPA). These regulations address hazardous waste management and disposal, but not the specific issues associated with a ship itself as a potentially hazardous waste.

a. RCRA

The Resource Conservation and Recovery Act (RCRA) is a U.S. law that provides the general guidelines for the waste management program envisioned by Congress.114 This program is under the jurisdiction of the U.S. EPA. The RCRA hazardous waste program, under Subtitle C, establishes a system for controlling and documenting hazardous waste from the time it is generated until its ultimate disposal, essentially from “cradle to grave.”115 RCRA regulations governing hazardous waste identification, classification, generation, management and disposal are located in the Code of Federal Regulations (CFR), 40 C.F.R. Part 260.116 Hazardous waste cargos and hazardous waste present on a ship destined for demolition would potentially come under this regulatory scheme, but hazardous components that are part of the ship itself are not regulated under RCRA.117 Thus, the ship may be

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115. Id. §§ 6921–6939(e).
117. See 42 U.S.C. § 6901 et seq. (2006) (§ 6903 might be interpreted to include the entire ship in the definition of hazardous waste, but such categorization remains unclear and has not been applied).
void of any hazardous waste cargo but may still have components within the ship’s construction, such as asbestos for fire retardants, and the ship would not fall under any regulatory authority by RCRA.

b. Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was established in 1976 under the United States Code Title 15, § 2601 for the Control of Toxic Substances.\(^\text{118}\) "TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint."\(^\text{119}\) Many of these chemicals are often found on ships destined for recycling and would potentially fall under this regulation if these were part of the ship’s cargo.\(^\text{120}\) Similar to RCRA, if the hazardous waste is a component of the ship itself, these hazardous waste components would not be regulated by TSCA and the ship would not be managed as containing hazardous wastes.

c. Marine Environmental Protection Committee

Also housed under the U.S. EPA is the Marine Environment Protection Committee (MEPC), which is a member of the International Maritime Organization (IMO).\(^\text{121}\) The U.S., which is represented by the U.S. EPA on the committee, has been a member state of the IMO since 1950.\(^\text{122}\) During the MEPC/IMO 60th session held over March 22–26, 2010, the MEPC continued its work on developing guidelines for safe and environmentally sound ship recycling—the “Ship Recycling Plan.”\(^\text{123}\) These guidelines are aligned with and meet the requirements of the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships, which was adopted in May 2009, and, once developed, will assist ship recycling facilities and ship operators to begin introducing voluntary

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\(^{120}\) Graham-Rowe, supra note 17, at 801.
\(^{122}\) Id.
\(^{123}\) Id.
improvements. However, the voluntary nature of the guidelines calls into question their consistency of application and enforceability.

d. U.S. Regulatory Conclusion

Overall, the U.S. regulatory scheme appears to only nibble at the edges of the problem, but fails to confront the shipbreaking issue head on. While the hazardous nature of the cargos is strictly regulated, the ship itself—which may contain a varied mix of hazardous materials—is not regulated and is free to be dismantled and re-used without any oversight.

2. European Union

The European Union (EU) unified several individual countries’ hazardous waste regulations following creation of the EU. This resulted in the Hazardous Waste Directive—(Directive 2008/98/EC). While this unified approach to the hazardous waste issue is a step in the right direction, it also still lacks specificity for the shipbreaking process. For example, controversy has arisen around the E.U. definition of ‘waste,’ which is defined as anything that the holder discards or intends to discard. Ship owners claim that outmoded ships that are still seaworthy are not actually being discarded, but are, instead, being recycled and, therefore, would not be considered a waste as the ship is not being discarded.


This directive clarified and unified some of the oldest E.U. law addressing hazardous waste. The directive defines hazardous and non-hazardous waste. This new approach sought to harmonize the various national regulations into a single, more effective framework. It aimed to prevent the illegal export and import of hazardous waste and to ensure that hazardous waste is managed safely and securely. The directive also established a system for the authorization of hazardous waste facilities and set down guidelines for the development of the inventory of hazardous materials and the ship recycling plan. These guidelines were intended to assist in the management of hazardous waste and to promote environmentally sound practices. The directive is a significant step towards the regulation of hazardous waste at a European level, providing a framework for member states to implement at a national level.
hazardous waste, and differentiates between recovery and disposal.\textsuperscript{130} Under the directive, E.U. member states are required to ensure that the hazardous waste is identified and recorded.\textsuperscript{131} States must also ensure that different categories of hazardous waste are not mixed, and that hazardous waste is not mixed with non-hazardous waste, unless the necessary measures have been taken to safeguard human health and the environment.\textsuperscript{132} Any facility or actions that carry out disposal operations must obtain a permit to operate and must track the origin and destination of the wastes within the E.U.\textsuperscript{133}


This E.U. directive is one of the most stringent laws on the prevention of trade of hazardous wastes, including shipments within, into, and out of the E.U.\textsuperscript{134} In July 2007, this regulation was replaced by WSR 1013/2006, which was designed to halt the movement of toxic ships from the E.U. to the Indian subcontinent.\textsuperscript{135} Under this regulation, a ship being exported for disposal would be prohibited unless it would was to be sent to a European Free Trade Association (EFTA) country that is also a party to the Basel Convention.\textsuperscript{136} Exportation of ships for recovery or recycling are also prohibited unless sent to a country that is a party to the Basel Convention or other bilateral or multilateral agreements which are compatible with the E.U. legislation.\textsuperscript{137}

This regulation covers ships destined for shipbreaking if the ship has built-in components which may contain hazardous materials of such quantity as to be considered a hazardous waste.\textsuperscript{138} This aspect of the directive was decided in the E.U. case of Upperton Ltd., with offices in Mauritius v. The Minister of Housing, Spatial Planning and the Environment.\textsuperscript{139} In that case, the Council of State opined that the ship “Sandrein” was a waste due to the amount of asbestos contained within the hull (a built-in component of the ship) which would pose risks that, when

\begin{itemize}
\item \textsuperscript{130} Id. at 9–10.
\item \textsuperscript{131} Id. at 12, 15.
\item \textsuperscript{132} Id. at 12–13, 15.
\item \textsuperscript{133} Id. at 16, 19.
\item \textsuperscript{134} Puthucherril, supra note 10, at 43.
\item \textsuperscript{135} Id.
\item \textsuperscript{136} Id. at 44.
\item \textsuperscript{137} Id.
\item \textsuperscript{138} See id. (explaining the E.U. directive’s system of classifying hazardous waste as either green, amber, or red, with red being the most hazardous).
\item \textsuperscript{139} Puthucherril, supra note 10, at 84.
\end{itemize}
dismantled, would qualify the ship as a “red list” hazardous waste under the directive.140

d. E.U. Regulatory Conclusion

The E.U. is similar to its counterpart in the U.S. regulatory scheme; hazardous components of ships are not addressed by the specific directives or, if addressed, are not subject to the E.U. regulations once the ship leaves the E.U.141

3. India, Pakistan, Bangladesh, and China – the Developing Countries

a. Bangladesh

Currently, Bangladesh is poised to become the world leader in shipbreaking, with the 2011 Bangladesh Supreme Court’s decision to lift a ban on the shipbreaking industry in the country.142 Bangladesh anticipates dismantling 300 ships by the end of 2012, an approximate 36% increase over 2009 numbers (before the ban was instated).143 While the shipbreaking industry in Bangladesh has been operating for approximately 40 years, there still is no legal regime in place to regulate this industry and it remains a market-driven activity.144

b. Pakistan

In 1999, Pakistan had a 15% share of the shipbreaking market.145 During that same year, the Pakistan government decided to increase the import duty on ships destined for demolition on Pakistan beaches to 45%.146 Consequently, the shipbreaking industry in Pakistan ground to a halt. This resulted in pressure on the government from industrialists and other lobbyists to lift the tax over the fear that Pakistan would no longer have a

140. Id. at 84–85.
141. See id. at 44–45 (noting that the directive focuses on the waste aboard a ship, rather than the components of a ship; also, reflagging the ship to a non-E.U. country removes it from the scope of the directive).
143. Id.
144. PUTHUCHERRIL, supra note 10, at 29.
145. Id. at 30, n.143.
146. Id.
shipbreaking industry.\textsuperscript{147} Bending to the pressure, the government relaxed the import duty, and, in 2006, Pakistan once again was taking ships for demolition and leaped into third place on the world stage in the shipbreaking market.\textsuperscript{148}

c. India

Today, activity at ASSBY is in steep decline, due mainly to the global recession, but also, in part, as a result of the introduction of a regulatory framework by the Supreme Court of India to provide cleaner and safer shipbreaking practices.\textsuperscript{149} This legal regime included such regulations as: guidelines for shipbreaking that minimize environmental impact and proper citing of shipbreaking areas; the 2003 Gujarat Maritime Board of Ship Recycling Regulations, which strengthens the current legislations for worker safety, welfare, and environmental protection in the province of Gujarat, which includes ASSBY; requirements for shipbreaking yards to comply with the International Maritime Organization (IMO) and International Labor Organization (ILO) conventions for shipbreaking, which have already been ratified by the Indian government; Ship Recycling Regulations (SRR), which mandate ship recyclers to ensure compliance with the Water Act of 1974, Air Act of 1981, Hazardous Waste Management and Handling Rules of 1989, and the Coastal Regulations Zone Notification of 1991; open burning of waste as prohibited by law; SRR rules for beaching of ships; and the fact that India is a party to the Basel Convention.\textsuperscript{150}

Unfortunately, this extensive framework has been slowly and systematically diluted by the very judiciary that spearheaded its creation, due primarily to pressures from trade organizations and economic challenges.\textsuperscript{151} The loss of business at ASSBY due to this regulatory regime was a windfall for Bangladesh, whose regulations were much weaker, if not totally non-existent.\textsuperscript{152} However, the Indian regulatory controls are being eroded by the both the government and the very Court that instituted them as market forces and trade organizations apply more and more pressure.\textsuperscript{153}

\begin{thebibliography}{99}
\bibitem{147} Id. at 30.
\bibitem{148} Id.
\bibitem{149} Id. at 53.
\bibitem{150} PUTHUCHERRIL, supra note 10, at 59–61.
\bibitem{151} Id. at 77.
\bibitem{152} Id.
\bibitem{153} Id.
\end{thebibliography}
The events of the *Clemenceau*[^154] and the *Blue Lady*[^155] in Indian waters and the reluctant response by the judiciary and the executive areas, in spite of extensive regulatory regimes, have shown the strong pull that these forces have had over the industry, as well as the ineffectiveness of developing countries’ national laws to regulate a global industry.[^156]

d. China

In 1993, China instituted a regulatory framework due to concern over the environmental impacts of the shipbreaking industry.[^157] These regulations on the Chinese shipbreaking industry proved to be a windfall for India’s shipbreaking yard, faltering under India’s failing regulatory regime, and causing detriment to China’s shipbreaking industry.[^158] China’s shipbreaking practices are now considered superior to the rest of Asia as a significant green recycling process.[^159]

e. Regulatory Conclusion

Developing countries, in general, argue that the recycling of waste products, such as ships, conserves natural resources, reduces strains on energy demands, minimizes waste disposal, and helps industrial growth by providing raw materials.[^160] Many times the government and/or the populace is willing to forego basic protections for the opportunity to make a living, or just to survive.[^161]

Most developing countries have various degrees of a regulatory framework for the protection of the environment and, in some instances, protection of the workers and their rights. However, it frequently seems that these regulations may not be written for the proper management and disposal of hazardous wastes, or, alternatively, any existing comprehensive regulations are simply not enforced. Even those countries that have no known regulatory oversight of the industry have essentially made a decision to allow no regulation over their shipbreaking business. In all cases, it seems that economic interests dominate over environmental or human

[^154]: *Infra.* Part VIII.B.
[^155]: *Infra.* Part VIII.A.
[^156]: PUTHUCHERRIL, supra note 10, at 54.
[^157]: *Id.* at 38.
[^158]: *Id.*
[^159]: *Id.*
[^160]: Sonak, supra note 55, at 155.
[^161]: *Id.*
health considerations during the regulatory decision making process. Where laws are limited or non-existent, decisions for drafting hazardous waste regulations seem to be overshadowed by a government that is either ill-equipped to handle the waste, uninformed as to the challenges that these types of waste streams present, or willfully blind to the problems and impacts of the mismanagement of hazardous waste. When regulatory frameworks are implemented and enforced, as in China, there seems to be an economic backlash. Shipowners and cash buyers choose cheaper and less regulated operations for their shipbreaking needs, ultimately reinforcing a government’s decision not to regulate for fear of losing the industry to their neighbors.

B. International Laws

A key challenge faced by any international set of regulations is the competing interests of the various nations involved. Consequently, a myriad of regulatory organizations, conventions, and agreements is usually involved that also results in a tangle of regulatory oversight. Unfortunately, this is the case for shipbreaking; no one set of regulations exists that specifically addresses this industry and its unique challenges.

The international legal regime is murky and struggles with the tradeoff between regulatory instruments and the obligations they place on the signatories. Some of the instruments are non-binding and others are non-specific in their application to shipbreaking.162 The international laws appear to have evolved as an accumulation of legacy regulations instead of an integrated approach specifically designed for the shipbreaking process.

1. Basel Convention

As an International treaty, the 1999 Basel Convention and Protocol (Basel Convention), attempts to bridge the gap between developed and undeveloped countries because the treaty signatories include members from all over the globe—developed and undeveloped nations alike.163 The basis of the Basel Convention arose in the 1980s out of international concern over the escalating increase in transboundary movement of hazardous waste
across national boundaries. As a result, the United Nations General Assembly directed the United Nations Environment Program to take action, and the result was the creation of the 1989 Basel Convention. By July 1997, 113 countries had voluntarily ratified one of the Basel Convention’s key outcomes: the “Control of Transboundary Movement of Hazardous Wastes and their Disposal” treaty. In 1999, the 1989 Basel Convention was revised to include a mechanism to assign liability and provide compensation for damages resulting from hazardous waste transboundary shipments (the Protocol of the Basel Convention). The 1999 Basel Convention and Protocol has now effectively become the first international environmental agreement. However, while the Basel Convention has been ratified by 146 nations, including the European Union member states, some countries, including the United States, have not yet ratified the treaty, and, therefore, are not bound by its articles.

The Basel Convention has three main goals: 1) to reduce the amount of hazardous waste generated worldwide, 2) to promote disposal of wastes as close to the source of generation as possible, and 3) to encourage the environmentally sound management and disposal of those wastes. The Convention mirrors the regulations of many developed countries in the aspect of notice and consent procedures for hazardous waste transportation. Exporting parties must notify the transporter and importing country, and communicate the nature of the wastes being exported to them. Only once the importing country provides written notification of acceptance may the exporter initiate transportation of the wastes. However the Convention goes one step further than most developed countries’ regulations by requiring shipments of hazardous waste to be allowed only to those countries that are able to manage the wastes in

165. Id.
166. Id.
168. Id. at 509.
169. Id. at 516.
170. Id. at 516–517.
171. Id. at 517.
172. Choksi, supra note 163, at 517.
173. Id.
an environmentally sound manner, regardless of whether the importing country agrees to take the waste.174

In 2002, the Basel Convention adopted the Technical Guidelines on the Environmentally Sound Management of the Full and Partial Dismantling of Ships (TGSD).175 Its goal was to develop the best practices in the “design, construction and operation of ship-dismantling facilities.”176 However, opponents have argued that the TGSD does not address issues to minimize the hazardous materials on board a ship prior to arriving at a ship recycling facility, and it is silent on the need to use dry docks as the environmentally sound method of dismantling ships.177

Another potential weakness of the Basel Convention is that it contains confusing definitions regarding what is waste and what is recyclable, which impacts whether or not waste material is subject to its jurisdiction.178 This problem causes ambiguity, confusion, and abuse for application and enforcement.179 It has been argued that the Basel Convention does not cover the hazardous waste components of ships that arise in the shipbreaking industry.180 However, the majority believes that ships destined for demolition are, in fact, themselves a waste product under the Basel Convention and, therefore, any wastes contained on that ship would fall under the Convention’s jurisdiction—including the hazardous ship components.181 This disparity in interpretation remains to be resolved.

2. Organization for Economic Co-Operation and Development Agreement

The Organization for Economic Co-Operation and Development (OECD) is an international organization established in 1961 to assist participating countries in achieving sustainable economic growth, employment, and an increased standard of living, while simultaneously

174. Id.
175. PUTHUCHERRIL, supra note 10, at 107.
176. Id. at 113.
177. Id.
178. See id. at 113–14 (illustrating that the shipping industry has used the Basel Convention to argue that material produced in the normal operation of a ship cannot be considered waste).
181. Id.
ensuring the protection of human health and the environment. OECD countries concern themselves with a host of international socio-economic and political issues, including environmental issues such as the transboundary movement of waste. Presently, there are 30 OECD member countries, including the European Union and the United States. On March 30, 1992, the OECD passed the “Control of Transfrontier Movements of Waste Destined for Recovery” that applies to transboundary movements of waste that are destined for recycling operations between OECD countries. This agreement provides a framework for OECD countries to control transboundary movement of recyclable waste in an environmentally sound manner between signatory OECD countries. This agreement would also have control over the shipbreaking industry, to some extent, regarding the recycling of wastes on these ships, including hazardous components of the ships themselves. However, it is only binding on those countries that are signatories to the agreement, speaks solely to OECD countries, and does not address non-recyclable wastes. These omissions in the OECD agreement leave the majority of the world’s countries, who are not signatories, to do as they please.

3. International Maritime Organization Guidelines

The IMO is the primary international agency for coordinating the development of rules on maritime issues. The IMO is a specialized agency of the United Nations that is responsible for measures to improve the safety and security of international shipping, and to prevent marine

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182. About the Organisation for Economic Co-operation and Development (OECD), OECD.org, http://www.oecd.org/pages/0,3417,en_36734052_36734103_1_1_1_1_1,00.html (last visited July 13, 2012).
184. Id. at 10.
185. Id.
186. Id.
187. Id.
pollution from ships.\textsuperscript{189} The IMO was established by the United Nations in Geneva on March 17, 1948, and currently has 169 Member States.\textsuperscript{190}

In December 2003, in a response to the growing need for regulation of the international trading of ships for shipbreaking, the IMO developed a set of voluntary guidelines aimed at improving the ship disposal process.\textsuperscript{191} Known as the IMO Guidelines on Ship Recycling (IMO{\textsuperscript{GSR}}, it proposes a “Green Passport” approach to ship breaking.\textsuperscript{192} The Green Passport is a document containing an inventory of all potentially hazardous materials used in the construction of a ship, which is intended to accompany the ship throughout its functioning lifetime.\textsuperscript{193} Thus, when the ship is sent for dismantling, the Green Passport would communicate the possible toxic threats to humans and the environment upon demolition. The document would also potentially encourage shipbuilders and designers to use alternatives to hazardous materials in designing their ships, leading, in principle, to an environmentally cleaner and safer ship.\textsuperscript{194} In addition, owners of existing ships are instructed to develop a Ship Recycling Plan (SRP) that would include the identification of suitable recycling facilities under IMO guidelines within the next five years.\textsuperscript{195}

Opponents criticize the IMOGSR because the obligation to ensure environmental and worker safety in the shipbreaking process falls to the shipbreaking facility and the regulatory authorities of the countries where the facilities operate.\textsuperscript{196} Additionally, it has also been noted that the IMOGSR does not address the option for prior decontamination of vessels before the ship arrives at the shipbreaking facility.\textsuperscript{197} This option would alleviate the burden placed on the facility to manage potentially hazardous materials and shift the burden to the ship owner or cash buyer to manage.

While the IMO appears to have developed one of the most focused sets of guidelines designed to improve the shipbreaking process through control of the shipbreaking facility, these guidelines are just that, voluntary suggestions that are not binding on any party.\textsuperscript{198} Additionally, the guidelines

\begin{footnotesize}
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\item \textsuperscript{189} Brief History of IMO, IMO.ORG, http://www.imo.org/About/HistoryOfIMO/Pages/Default.aspx (last visited July 7, 2012).
\item \textsuperscript{190} Member States, IGOs, and NGOs, IMO.ORG, http://www.imo.org/About/Membership/Pages/Default.aspx(last visited July 7, 2012).
\item \textsuperscript{191} Bhattacharjee, supra note 184, at 207.
\item \textsuperscript{192} Id. at 208.
\item \textsuperscript{193} Id.
\item \textsuperscript{194} Id.
\item \textsuperscript{195} Bhattacharjee, supra note 184, at 207.
\item \textsuperscript{196} PUTHUCHERRIL, supra note 10, at 141.
\item \textsuperscript{197} Id.
\item \textsuperscript{198} Id. at 143.
\end{itemize}
\end{footnotesize}
exist amid a sea of other binding and non-binding regulatory frameworks, making the guidelines potentially less significant.\textsuperscript{199}

4. Law of the Seas (LOS)

In 1982, the LOS was adopted by the Third United Nations Conference on the Law of the Sea.\textsuperscript{200} Its key element is the obligations of 150 states, who are parties to the LOS convention, to control pollution from land-based activities, such as shipbreaking, through creation of regulatory frameworks.\textsuperscript{201} Unfortunately, the major shipbreaking states of India, Pakistan, and Bangladesh, who are parties to the LOS Convention, have yet to enact measures to prevent such pollution—especially since there appears to be no incentive to do so.\textsuperscript{202}

5. Hong Kong Convention

The Hong Kong Convention (HKC) is an international convention that was developed under the framework of the IMO.\textsuperscript{203} The output of the convention was the Safe and Environmentally Sound Recycling of Ships agreement, which was adopted in Hong Kong in May 2009.\textsuperscript{204} The HKC is expected to enter into force in 2015.\textsuperscript{205} The preamble of the HKC demonstrates the commitment of the IMO to obligate the signatories to the convention; it calls upon the signers to “give full and complete effect” to its terms.\textsuperscript{206} Parties to the convention are to adopt effective measures to ensure that ships entitled to fly the HKC flag or operate under the HKC authority comply with the requirements of the agreement.\textsuperscript{207} The HKC applies control and enforcement measures from two angles: 1) it establishes a set of standards that apply to ships during their operational lifetime, and 2) it establishes standards for the operation of the ship recycling facilities.\textsuperscript{208} The HKC defines “ship recycling” to include the process of recovery of “components and materials for re-processing and re-use, while taking care of hazardous and other materials, and includes associated operations such

\begin{itemize}
\item \textsuperscript{199} Id. at 144.
\item \textsuperscript{200} Id. at 116.
\item \textsuperscript{201} PUTHUCHERRIL, supra note 10, at 117.
\item \textsuperscript{202} Id.
\item \textsuperscript{203} MIKELIS, supra note 74, at 11.
\item \textsuperscript{204} Id.
\item \textsuperscript{205} Id. at 29.
\item \textsuperscript{206} PUTHUCHERRIL, supra note 10, at 148.
\item \textsuperscript{207} Id. at 149.
\item \textsuperscript{208} Id.
\end{itemize}
as storage and treatment of components and materials on site." While this definition does not cover all aspects involved in further processing or disposal of material, it does capture the immediate environmental concerns associated at the point of demolition of the ships, including management of waste and hazardous waste materials.

Ship recycling facilities authorized under the HKC are only to accept ships for recycling that comply with the requirements of the HKC—mainly HKC flagged ships. However, non-HKC flagged ships may still be taken by the facility for recycling, as long as the ship is in compliance with HKC standards. The idea behind this requirement is two-fold: 1) to ensure HKC-compliant ship recycling facilities a consistent flow of HKC-compliant ships for processing, and 2) to encourage ship owners to use HKC-compliant recycling facilities. These two elements hopefully will curtail both the flow and financial profitability of producing or owning non-HKC-compliant ships, and the continued existence of non-HKC compliant recycling facilities. However, each signatory state that has an HKC-authorized ship recycling facility will be responsible for ensuring that the recycling facility is designed, constructed, and operated in a safe and environmentally sound manner.

All HKC ship recycling facilities are to develop a series of plans and trainings to ensure environmental and worker protection, including emergency response and preparedness for accidents and spills, worker safety and training, environmentally sound management of hazardous wastes, procedures for preventing adverse effects to human health and the environment, and a ship recycling process.

A key requirement under the HKC is the Inventory of Hazardous Materials (IHM) that is to be completed by the ship owner and provided to the recycler before commencement of recycling. Materials to be included in the IHM are asbestos, PCBs, ozone depleting substances, tributyltin, metals, flame retardants, and radioactive substances. In addition,
asbestos, PCBs, ozone depleting substances, and tributyltin are to be banned for use by all signatory parties under the agreement in all new ship construction.\textsuperscript{219} Metals, flame retardants, and radioactive substances can still be part of a ship’s design, but must be declared in the IHM.\textsuperscript{220}

Once a ship is designated to be dismantled, the HKC agreement requires the ship to notify the country of registration and to obtain an International Ready for Recycling certificate, certifying the ship is free of hazardous materials.\textsuperscript{221} Under the agreement, the shipbreaking process is to take place in facilities that are properly equipped and able to safely manage those hazardous materials which may be specifically present within the individual ships, for the sake of their workers and the environment.\textsuperscript{222}

Violations of the HKC by either the ships or the ship recycling facility are to be prohibited under the national law of the signatory states.\textsuperscript{223} Additionally, the signatory states are to establish sanctions that are adequate in severity to deter non-compliance.\textsuperscript{224} Therefore, there is an obligation by the HKC upon the signatory states to implement within each state their own national HKC regulatory regime.

In combination, the IMO guidelines and the HKC agreement appear to address the issues involving the shipbreaking process most comprehensively. Unfortunately, neither of these two regulatory schemes are recognized as international law and, hence, are non-binding upon non-signatory states. But the hope is that this will change in the near future with increased awareness of the global environmental impact caused by unregulated shipbreaking.

\textit{C. Regulatory Loopholes}

As discussed, many countries have taken the initiative and have implemented strict regulations for the proper management and disposal of hazardous materials contained on their vessels destined for demolition. In spite of all the regulations and legislation to prevent the mismanagement of hazardous waste containing ships sent for demolition, unscrupulous ship owners have developed techniques to bypass the laws.\textsuperscript{225} The owners of many ships registered in highly regulated countries often prefer to resort to

\begin{footnotesize}
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\item \textsuperscript{219} Id. at 16.
\item \textsuperscript{220} Id.
\item \textsuperscript{221} MIKELIS, supra note 74, at 17.
\item \textsuperscript{222} Id. at 20.
\item \textsuperscript{223} PUTHUCHERRIL, supra note 10, at 164.
\item \textsuperscript{224} Id.
\item \textsuperscript{225} Id. at 45.
\end{itemize}
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“reflagging” end-of-life ships with a flag of convenience,\textsuperscript{226} which allows the real owner to hide their identity and to circumvent any regulatory obligations required by their respective countries.\textsuperscript{227} Many countries allow this re-flagging because their maritime law is lax and/or unscrupulous ship owners wish to reduce operating costs by avoiding government regulations or taxes.\textsuperscript{228} This approach allows the ship owner to easily broker the ship for demolition without the burdens imposed by the regulations of the country where the ship is truly registered.\textsuperscript{229} The IMO guidance does not allow the use of flags of convenience, which should reduce or close this loophole for regulatory abuse.\textsuperscript{230}

Another way ship owners can avoid their regulatory obligation to properly manage a ship’s hazardous waste is by selling the ship to another individual and shifting the obligation to the purchasing individual to manage the ship. In return, the purchaser reaps the financial rewards of selling the ship for scrap.\textsuperscript{231} Such a sale can also be accomplished through offshore shell companies, which can mask the details from regulatory scrutiny.\textsuperscript{232}

\textbf{VIII. A Tale of Two Ships—A Case Study}

In light of all the regulations and oversight in many developed countries to ensure proper disposal of ocean vessels and their wastes, it would seem that there should be less chance for mismanagement of the ships that originate in such countries. However, the following case studies exemplify the ongoing challenges and the varying outcomes that have resulted, even in countries that have extensive regulatory oversight.

\begin{itemize}
\item \textsuperscript{226} What are Flags of Convenience?, INTERNATIONAL TRANSPORT WORKER’S FEDERATION, http://www.itfglobal.org/flags-convenience/sub-page.cfm (last visited July 22, 2012). A flag of convenience is a method of flying a flag recognizing the ship as belonging to a country other than that of the ship owner and/or registration. \textit{Id.}
\item \textsuperscript{227} \textit{Id.}
\item \textsuperscript{228} \textit{Id.}
\item \textsuperscript{229} \textit{Id.}
\item \textsuperscript{230} Mikelis, supra note 74, at 17.
\item \textsuperscript{231} Demaria, supra note 1, at 252.
\item \textsuperscript{232} \textit{Id.} at 251.
\end{itemize}
A. Blue Lady

The S.S. France was the longest French passenger ship built in 1960, and the ship was touted as the world’s most glamorous cruise ship. In 1979, the ship was sold to the Norwegian Cruise Lines and renamed the S.S. Norway. However, in 2003, the ship was seriously damaged by a boiler explosion in Miami and was towed to Germany for repairs. In 2004, it was determined that it was not economically feasible to remove the asbestos from the damaged area of the ship to complete the repairs, and, consequently, the ship departed Germany en route to Singapore for demolition in 2005. Because the ship owner intended to discard the ship, the S.S. Norway became waste by regulatory definition, under the E.U. Waste Shipment Regulations. Additionally, the presence of a hazardous substance such as asbestos would also cause the ship to be considered a hazardous waste under the 1999 Basel Convention. The ship arrived in Malaysia with plans to be sold and dismantled in Bangladesh; however, due to protests by the Bangladeshi Environmental Lawyers Association (BELA), the sale was voided. In 2006, the ship (then in Dubai) departed under the guise that it would be repaired for reuse, but, in reality, the S.S. Norway was headed for ASSBY for demolition. In June 2006, the ship was sold through the Norwegian Cruise Line in Bermuda to the Liberian company Bridgeed Shipping, and, after one month, the ship—now renamed the Blue Lady—was sold, yet again, to two other shipbreaking companies for 15 million dollars. The Blue Lady was initially beached illegally at ASSBY in 2006, but was eventually allowed to be dismantled by an Indian Final Court Order in September 2007.

The Indian Supreme Court battle that ensued while the Blue Lady resided on the beaches of ASSBY pitted Indian environmentalists and villagers against the will of the government. The environmentalists argued that, because the ship contained 1250 tons of asbestos and

233. Id. at 257.
234. Id.
235. Id.
236. Demaria, supra note 1, at 257.
237. Id.
238. Id.
239. Id.
240. Id.
241. Demaria, supra note 1, at 257.
242. Id.
243. See generally Demaria, supra note 1, at 257–59 (noting that both environmentalists and villagers brought legal challenges to the government’s decision to dismantle the Blue Lady).
radioactive materials in fire detectors, its importation was banned under both the 1999 Basel Convention (to which India is a signatory), as well as the 2003 Indian Hazardous Waste Rules.\textsuperscript{244}

The Iron Steel Scrap and Shipbreakers Association of India argued that shipbreaking is an environmentally friendly activity because recycling the materials saves non-renewable resources, the process does not produce solid waste, and even the IMO recognizes shipbreaking as a green industry.\textsuperscript{245} The association went on to state that the regulations did not cover ships themselves as hazardous waste; therefore, the national and international regulations for the transport of hazardous waste should not apply.\textsuperscript{246} Furthermore, the Indian Supreme Court noted that dismantling the Blue Lady would employ 700 workers and provide 41,000 tons of steel, which would, in turn, reduce the demand for mining activities in other parts of the country.\textsuperscript{247}

The Supreme Court opined that “[w]here the commercial venture or enterprise would bring in results which are far more useful for the people, the difficulty of a small number of people [the local villagers that would ultimately be impacted by the activity] has to be bypassed.”\textsuperscript{248} In essence, the Court believed the balancing of the hardships tipped in the favor of the generation of revenue, employment, and the public interest as opposed to environmental and human protection.\textsuperscript{249}

\textbf{B. Le Clemenceau}\textsuperscript{250}

Le Clemenceau was a French aircraft carrier decommissioned in 1997 and destined for ASSBY in 2005.\textsuperscript{251} Before the ship entered Indian waters, Indian environmentalists began to wage a campaign against the vast amounts of toxic wastes still on board in components of the vessel itself.\textsuperscript{252} The Le Clemenceau allegedly contained 550 tons of asbestos and an unknown quantity of PCBs.\textsuperscript{253} Because asbestos was still present on the ship destined for demolition, the ship would be classified as a hazardous waste

\textsuperscript{244} Id.
\textsuperscript{245} Id. at 258.
\textsuperscript{246} Id.
\textsuperscript{247} Id.
\textsuperscript{248} Demaria, supra note 1, at 257–58.
\textsuperscript{249} Id. at 258–59.
\textsuperscript{250} Sonak, supra note 55, at 150.
\textsuperscript{251} Id. at 151.
\textsuperscript{252} Id.
\textsuperscript{253} Id.
under the 1999 Basel Convention, and the importation would not be allowed under the 2003 Indian Hazardous Wastes Rules. Neither Turkey, Greece, nor even Bangladesh would accept the Le Clemenceau for shipbreaking, even though the 22,000 tons of steel in the ship would be highly profitable.

In France, a court had originally allowed the transportation of the vessel to India for dismantling, since French authorities declared the ship to be decontaminated of all toxic materials including 115 tons of asbestos. However, the authorities did state that 45 tons of asbestos-containing materials might still be on the ship. The authorities also argued that, because this was a military vessel and had sovereign immunity, it would not fall under the 1999 Basel Convention or the European Waste Shipment Regulations, and, therefore, should not be considered a waste.

The Indian Supreme Court invited the French company Technopure, which had decontaminated the ship, to appear before the Court and provide details on the situation. Technopure claimed that they removed 70 tons of asbestos from the ship, but there was still at least 500 tons still on board that could and should be removed in France.

Consequently, a higher French court overturned the decision of the lower court to send the ship to India and the French President recalled the ship to French waters, where it presumably still resides. The ship’s ultimate fate is currently unknown.

IX. WHERE ARE WE TODAY—ARE WE THERE YET?

Much has changed in the world since the early days of shipbreaking management, when “out of sight, out of mind” was the mantra for the disposal of aged shipping vessels. It once seemed justifiable to send such wastes to anyone who wished to pay to take the material. The developed world may have known or, perhaps, did not care if those countries and individuals had the ability to properly manage the materials. The attitude seemed to be *caveat emptor*—let the buyer beware. However, with the present global awareness of the challenges and threats that shipbreaking

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254. Id.
255. Sonak, supra note 55, at 151.
256. Id.
257. Id. at 152.
258. Id. at 151.
259. Id. at 152.
260. Sonak, supra note 55, at 152.
poses, it is irresponsible, unethical, and unreasonable to turn a blind eye to the environmental and human impacts of any country’s improper management of these wastes.

In 2009, U.S. EPA Administrator Lisa Jackson signed a final rule revising regulations on transboundary hazardous waste shipments between countries to make the current U.S. regulations more consistent with the international standards, including the OECD agreement. This new rule will also affect RCRA, better aligning its application with the Basel Convention agreement.

The E.U. also has plans to implement new Ship Recycling Convention rules by 2015, which would require that inventories of hazardous waste materials be compiled for ships to be sent for scrapping, and would require shipbreaking yards to demonstrate their ability to properly manage those inventoried wastes.

However, despite international recognition of the need for greater oversight and regulatory protection of the environment, and the apparent beginnings of a united international approach, not everyone is happy with the changes that are on the horizon. For example, shipbreaking industry representatives from India, Pakistan, and Bangladesh have organized to form a common front to lobby their governments not to ratify the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships agreement. As mentioned previously, this agreement was drafted by the IMO with a key goal of improving environmental and worker safety standards for the shipbreaking industry to level the playing field between developed and developing countries. Pravin Nagarsheth, president of the Iron Steel Scrap and Shipbreakers Association of India, believes the Convention will make shipbreaking using the beaching method impossible, and thereby put an end to the industry in South Asia. Instead, he favors individual governments regulating environmentally sound and labor-safe scrapping methods—in direct opposition to the intent of the HKC agreement.

262. Id.
265. Id.
266. Id.
267. Id.
X. WHERE DO WE GO FROM HERE? RECOMMENDATIONS FOR THE FUTURE

Given the global nature of the shipbreaking industry, the complexity of waste materials and their management, and the overlapping and tangled national and international regulatory structures currently in place, there is a need, as well as a unique opportunity, for an international legal regime to be developed.268 A unified, integrated approach to the variety of current regulatory schemes would seem to be the most practical way forward. The IMO and HKC are currently the most comprehensive and progressive schemes to date, but are still lacking global acceptance and enforceability. Any unified approach should include the following elements:

• Creation of a single international set of environmental regulations comprising all the successful aspects of the various national and international regulatory schemes currently in place. Coordinated ratification will be required from a majority, if not all, of the ship building and ship recycling countries. Should a country choose not to participate, then ships from participating states should not be permitted to be sent to or received from such a non-member state without increased regulatory oversight or cost to the ship owner.

• Creation of an International Environmental Policing Task Force to enforce this new international environmental program. The task force would have the ability to inspect ships, shipbreaking facilities, and the associated recycling processes for compliance with the international regulations. The task force would be comprised of members from all the states that are a party to these regulations and would possess the policing powers for enforcement of the regulations, including referring cases to the international environmental court for further litigation.

• Creation of an international environmental court with jurisdiction for transboundary transportation of hazardous waste in all forms, including the hazardous waste on ships as well as the ships as hazardous wastes themselves. If hazardous waste is transported across

268. PUTHUCHERRIL, supra note 10, at 52.
national boundaries, then it will fall under the purview of this court, which will be charged with enforcing the international environmental regulations, similar in function to the Hague in Brussels.

- Expanded policing and use of the current export/import agreement documentation scheme already in place under the OECD agreement. This would involve notification by the exporting state of the ship to the importing state of the ship for shipbreaking. The importing state would need to agree to accept the ship for demolition and be able to demonstrate the ability to manage the types of materials that would be present on the ship in a manner that is protective of human health and the environment. It would be the responsibility of the exporting state to ensure that the importing state was able to handle these materials and it would be the responsibility of the importing state to ensure that the exporting state's ship does not contain materials not disclosed. Documentation of these transactions would need to be maintained and verified by each state’s governmental agency assigned for this responsibility. These documents would need to be made available to the International Environmental Policing Task Force for compliance review.

- Require all hazardous materials to be removed from the ship prior to demolition, regardless of whether the ship is being sent from a signatory state or not. The cost of removal of these materials would be the responsibility of the current ship owner. This would place the financial burden of cleanup upon the last owner and would reduce the current process of selling off the ship to an intermediary who only reaps the financial rewards for the demolition. That intermediary would have to pay for the cleanup or charge the previous ship owner for the cleanup of the ship. Either way, the ship would no longer be just a financial gain, but also a financial responsibility for cleanup.

- Establishment of a consistent international system for discriminating hazardous waste for disposal from hazardous waste for reuse or recycling. Materials that are to be used as second hand products with little or no
refurbishing should be designated as recyclable. Those materials that are not to be reused as second hand products should be designated as waste. Lastly, items that are not to be used as second hand products, but have components able to be salvaged, should have a designation such as “recyclable waste material.” These three categories of hazardous materials would eliminate the current confusion concerning when a material is a waste or not, and would afford states the ability to make better educated decisions regarding the types of materials they wish to export, transport, or import including ship waste and waste ships.

- Establishment of a mechanism to ensure states and their hazardous waste processing facilities (whether recycling, salvaging, or disposal) meet international standards for environmentally sound and labor-protective processes. It would be the responsibility of the International Environmental Policing Task Force to enforce compliance.

- Establishment of an intellectual exchange program for developed countries to provide knowledge and support to developing countries for methods in shipbreaking, ship recycling, and proper management and disposal of hazardous wastes in an environmentally safe and worker-protective manner.

These recommendations, in conjunction with the IMO guidelines and HKC agreement, would provide a solid framework that ship builders, ship owners, and shipbreakers could rely upon for consistent and level regulatory oversight and enforcement. The playing field would be equal in all aspects and for all participants.

It may be argued that market forces should be allowed to dictate how and where ships are demolished. Subsidies to those states that use methods of demolition that are protective of human health and the environment would make those locations more attractive. However, it should be evident from this research that this has not been the case. Market forces have taken us to where we are today because market forces are interested in financial gain, not necessarily the loftier goals of human health and environmental protection.

Another argument has been to require the original purchaser of the ship to provide financial assurance that travels with the ship to cover the costs of
demolition. However, a mechanism to manage such a financial assurance trust fund, much like the now defunct Superfund, seems even more fraught with bureaucracy and management issues.

While international agreements are only binding on those states that choose to become signatories, and some states may choose to be a signatory with reservations, or some states may choose not to participate at all, a concerted effort, much like the world saw during the banning of chlorofluorocarbon (CFC), is not so far-fetched. We are a global community, able to work together to coordinate a worldwide ban on CFCs, even if some states did not experience the same effects as other states, with
minimal international agreements. So why not in this instance? This is a global issue and we all have a stake in ensuring a positive outcome, regardless of where a state is in the chain of demolition. Globally, we need to be protective of human health and the environment for all states, including our own. No one wants to be unsure of whether products or fish they may be consuming have been contaminated with hazardous materials. Everyone has a right to a clean and safe environment.

CONCLUSION

As a global community, we are certainly on the right track to ensure the safe management of shipbreaking in a manner that is protective of both people and the environment. We have come a long way from the days of allowing solely market forces to drive the final destination of ships containing and/or comprised of hazardous materials. While we may have more ground to cover in drafting and ratifying an integrated set of international regulations into a solid legal document with universal enforcement capabilities and incentives, this goal is clearly in sight in the near future.

It is easy to dismiss the hard decisions each nation must make in taking responsibility for shipbreaking as political ideologies. It is easy to overlook the fact that mismanaged shipbreaking can impact the health and environment of us all. Questions such as, “who are we to impose our value systems on the backs of another country?” or “aren’t we providing other countries with resources and second hand goods they so desperately need?” have political and ethical issues that divide us globally.

The hard reality is that environmental degradation resulting from mismanaged shipbreaking ultimately has no borders; it pollutes equally. Pollution does not remain within the arbitrary political boundaries of a particular country’s borders. The pollution that occurs in one country and contaminates the plants, animals, and people can easily travel in water, food crops, marketed meats, or even donated organs to the unsuspecting recipient. We may be eating the same heavy metals taken up in leafy vegetables that arrived in our local grocery that were grown on land where a vessel was sent to be dismantled on a far off beach. We may be enjoying a steak or seafood meal in a restaurant or in our homes that derives from those same distant and polluted shores.

We have an opportunity to make a change in our global regulatory structure to create a legal framework that will effectively manage the shipbreaking industry, but it will require the cooperation of the entire international community. We should set aside our individual disagreements and sometimes nationalistic, myopic viewpoints for the protection of the global population and the environment. Certainly, we have been able to address challenging global environmental issues in the past, as seen in the success of the ban on CFCs. We are very close to an international solution on shipbreaking, and, optimistically, we will see improvement in the way the industry is managed within the next decade, if not sooner!
ANALYSIS OF THE PRACTICE OF WATER POLLUTION PUBLIC INTEREST LITIGATION: BASED ON CASES HANDLED BY THE GUANGZHOU MARITIME COURT

Li Zhiping*

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INTRODUCTION

In December 2009, the Center of Environmental Resources and Energy Law and the Environmental Law Clinic at Sun Yat-Sen University School of Law researched and analyzed water pollution public interest cases (mostly arising from oil spills) decided by the Guangzhou Maritime Court. The research group, directed by the author, sought to explore the development of environmental public interest litigation, identify its existing problems, and improve the environmental public interest litigation system. Having screened 34 water pollution cases, the research group identified 14 cases of public interest litigation as the research object.

The research group used two standards to choose cases. The first standard is based on the type of plaintiff that initiated the case. Current law does not specify who can be a plaintiff in public interest litigation; however, observation of the judicial practice shows that cases are usually initiated by administrative authorities, prosecutors, and a small number of non-governmental organizations. Therefore, the research group focused on the cases involving such plaintiffs. The second standard is based on the type of claim at issue in the litigation. The purpose of public interest litigation is to remedy damage to national and public interests. Administrative agencies can file suit to protect the private interests of their sector. Thus, only those cases which claim compensation for damage to the national marine fisheries resources, the costs of eliminating marine pollution, and rehabilitation of the environment constitute public interest cases. The 14 selected cases are
civil cases of public interest litigation.¹ This article is based on the
classification and analysis of the selected cases.

I. ANALYSIS OF PLAINTIFF STANDING

A. Types of Plaintiffs

An administrative authority filed 12 of the 14 public interest suits, while
the prosecutors filed two. Of the 12 lawsuits filed by the
administrative authority, the Oceanic and Fisheries Administrator of
Guangdong Province filed eight. Other agencies that filed lawsuits include
the Environmental Protection Agency (Zhuhai Municipal Environmental
Protection Bureau), the Environmental Health Agency (Environmental
Hygiene Department of Zhuhai), the Governmental Agency (Zhuhai Qiao
Management District), and the Maritime Affairs Agency (Shantou Maritime
Affairs Bureau). Some administrative authorities initiated legal proceedings
according to explicit authorization by law. For example, the Administrator
of the Oceanic and Fisheries Administration—a marine environmental
protection, supervision, and management department—was delegated by
law to claim compensation for the national oceanic resource losses from the
responsible person on behalf of the State.² Other administrative authorities
have a duty to file suit. These agencies undertake the responsibility of
environmental supervision and management. When a third party pollutes
waters, the agencies must take measures to eliminate the pollutant and
therefore incur costs for clean-up and rehabilitation. According to the
Polluter Responsible principle, the polluter is obliged to eliminate the
hazard and remove obstacles.³ Therefore, the polluter should pay the
clean-up cost. The administrators file claims to require the polluter to pay
the clean-up cost and request that the polluter undertake the responsibility
of cleaning up the pollution. Most of the suits filed by administrators
include claims based on the Polluter Responsible principle. The two cases

¹. No environmental public interest litigation case against government administrative
decisions has been accepted by the court at this time.
². This is according to Article 41 of the 1982 Marine Environmental Protection Law, later
replaced by Article 90 of the 1999 Marine Environment Protection Law. Marine Environment Protection
23, 1982, effective Mar. 1, 1983) 1983 CHINA LAW LEXIS 142, art. 41 (China); Marine Environment Protection
initiated by the Procuratorate are claims to maintain public environmental safety and protect the public interest.

B. Argument of Plaintiff Standing

Of the 14 cases, the plaintiff’s standing was challenged in nine cases (64.2% of total cases), standing was not challenged in two cases (14.2%), and there is no information on the issue of standing in the remaining three cases, which were settled by mediation (there are no explanations referring to standing disputes in the mediation decisions). The arguments against standing include: (1) the plaintiff is not entitled to file a suit for resource damages on behalf of the nation; (2) the plaintiff has no direct interest in the case, which is required by Article 108 of the Civil Procedure Law; ⁴ (3) since the plaintiff, as an administrative department, is not an equal civil subject with the defendant, it is unfair to bring a civil suit against the defendant; and (4) the defendant is not authorized to exercise supervision and management of the marine environment. It is worth noting that the two public interest cases brought by the Procuratorate did not include challenges to the plaintiff’s standing.

Regardless of whether there was a challenge, the court approved the plaintiff’s standing in all fourteen cases. This indicates that the court has an open-minded attitude towards plaintiff standing. However, the court also carefully analyzed challenges to a plaintiff’s standing raised by the defendant. The following discussion of three example cases shows how the court has given detailed attention to these issues.

In Oceanic and Fisheries Administrator of Guangdong Province v. Shipping Co., Ltd., Taizhou, East China Sea, Fujian, China Marine Bunker (Petrol China), Co., Ltd., a marine pollution and damage compensation dispute, the court verified the oceanic and fisheries administrator’s standing to file claims for compensation for marine resource damages. ⁵ The court held: “The marine resources in the territorial sea of the People’s Republic of China belong to the People’s Republic of China. Local people’s government, as the delegate of [the] nation in certain region[s], has the right

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and obligation to maintain national resource’s property in the jurisdiction.”

The “Oceanic and Fisheries Administrator of Guangdong Provincial is the functional department of People’s Government of Guangdong Province, in charge of the comprehensive management of marine [resources] and aquaculture. The administrator is responsible for the asset management of waters’ and coastal zone natural resources, for the marine environmental protection and [for] safeguarding national maritime right and interest.”

Therefore, the court stated:

When the ownership of national resources has been infringed upon, the plaintiff, as [the] nation’s regional representative, has the right and obligation to uphold [the] nation’s ownership. The plaintiff has [a] direct interest in this case. The plaintiff’s standing . . . complied with the law, and therefore, [the] Oceanic and Fisheries Administrator of Guangdong Provincial is eligible to be the plaintiff . . . .

When the administrative authority is exercising direct coercive power, given by the nation, to [the] executive, from which the subordinate relationship of managing and being managed emerges[,] such subordinate relationship doesn’t associate with their own property relations, in another word[s], their equal relationship in civil law. At that time, the plaintiff is the administrative subject. When the administrative authority is exercising ownership right[s] given by the nation[,] by claiming for damage compensation, it is [a] right rather than [a] power. The civil property relationship is equal, having nothing to do with the administrative legal relationship. Therefore[, ] the case is not coercive, and the purpose of reinstating the original right can only be achieved [by] equal negotiating or legal proceedings. The administrative authority is the civil subject in this time. There is no conflict between the public and the private law, instead, they each attend[] to their own duty, forming an organic whole. The integrity and seriousness [have] not been destroyed, on the contrary, [they have] been maintained.  

6. Id.
7. Id.
8. Id.
9. Id.
In Environmental Protection Bureau of Guangdong Province, Zhuhai Municipality v. Shipping Co., Ltd. Taizhou, East China Sea, Fujian, China Marine Bunker (Petrol China), Co., Ltd., a marine pollution and damage compensation dispute arising from the same incident as in the previously discussed case, the court verified the Environmental Protection Agency’s standing to file claims for compensation for marine resource damages.\(^\text{10}\) The court held that the responsibilities of the Environmental Protection Agency include the protection and management of the marine environment and the right to represent the nation to file claims for environmental damage within its jurisdiction.\(^\text{11}\)

In People’s Procuratorate of Haizhu District of Guangzhou Municipality v. Zhong-Ming Chen, a water pollution and damage compensation dispute, the court verified the Procuratorate’s standing to be the plaintiff.\(^\text{12}\) Despite the party not formally challenging the prosecutor’s standing, as noted above, the court chose to address the question because it is a significant contemporary legal issue. The court held that the water belongs to the nation.\(^\text{13}\) According to Article 73 of the General Principles of Civil Procedure Law of the People’s Republic of China, the whole people shall own state property.\(^\text{14}\) State property is sacred and inviolable, and no organization or individual shall be allowed to seize, encroach upon, privately divide, retain, or destroy it.\(^\text{15}\) State owned water resources shall not be illegally abused or destroyed by any organization or individual.\(^\text{16}\) When water resources are abused or destroyed, the State is entitled to claim compensation from the violator in order to make up for the damages.\(^\text{17}\)


\(^\text{11}\) Id.


\(^\text{13}\) Id.


\(^\text{15}\) Id.

\(^\text{16}\) People’s Procuratorate of Haizhu Dist.

\(^\text{17}\) Id.
The Procuratorate is the State’s legal supervisory organ.\textsuperscript{18} The Procuratorate has the duty to protect national property and resources against illegal infringement, and the prosecutorial power to bring a lawsuit on behalf of the State when state property and resources are illegally infringed upon.\textsuperscript{19}

The verifications of the plaintiffs’ standing in the above cases illustrate the court’s deep understanding and mastery of the statute and legal spirit of interested parties in public interest cases. These cases not only provide useful guidance for the judicial practice, but also provide a beneficial analysis perspective for the theory.

\textbf{C. Analysis and Suggestions}

The disputes over plaintiff standing in the analyzed cases illustrate that: (1) generally, people don’t understand the necessity of the administrative authority’s claim for compensation for national resource damage through a civil suit; (2) there are some disagreements over who can represent state environmental resources; (3) the provisions of the law are not clear enough; and (4) it is a litigation strategy of the defendant to challenge the plaintiff’s standing.\textsuperscript{20} Therefore, the following efforts should be implemented.

1. Clarifying the Justification for Administrative Authorities to Bring Public Interest Litigation

The State has a dual identity. First, it is the subject of the political power; second, it is the subject of state-owned property. Since the state-owned property is set for the public interest and the exercising of state-owned property is aimed to protect public interests, the protection of state-owned property, therefore, often resorts to the power of state government. As regime subject, the State is empowered to exercise administrative measures to protect the state-owned property, such as administrative examination and approval, administrative licensing, administrative authorization, administrative penalties, and administrative charges.\textsuperscript{21} These measures are aimed at regulating the operation,

\textsuperscript{18.} \textit{Id.}
\textsuperscript{19.} \textit{Id.}
\textsuperscript{20.} Some defendants want to increase the plaintiff’s difficulties or prolong the length of litigation by raising a standing dispute.
\textsuperscript{21.} See \textit{Xianfa} art. 89 (1), § 3 (1982) (China) (stating that the State Council exercises the power “to adopt administrative measures, [and] enact administrative regulations”); \textit{see also} Law of the People’s Republic of China on Administrative Penalties (promulgated by the Nat’l People’s Cong. Mar. 17, 1996, effective Oct. 1, 1996) 1996 CHINA LAW LEXIS 595 (China) (“standardizing the creation and
management, usage, and processing of state-owned property, and preventing property from loss and damage. In addition, the measures are also aimed at enforcing penalties and providing remedies when property is damaged. When state-owned environmental resources are damaged, people tend to believe that those administrative measures—particularly the charging of fees for the rights to develop and utilize environmental resources—alleviate any need for additional compensation. The State also has the power to charge administrative fines, which can be seen as compensation.

However, an administrative remedy cannot provide complete and adequate relief for the loss of state-owned environmental resources because an administrative fine cannot substitute for civil compensation, and the environmental protection fee does not fully compensate for the loss of state-owned environmental resources. First, the administrative fine is an administrative, rather than a civil, penalty. When the violator infringes on an individual’s personal property and belongings, the administrative penalty is not a substitute for civil compensation. Though the violator is subject to some monetary penalty, the amount of the fine is not based on the actual loss.22 Full compensation can only be sought by asserting a civil claim. Even if administrators want the violator to pay a fine, the applicable territorial and level of jurisdiction restrict this kind of penalty. If the infringement and the damaging consequences do not occur in the same place, then the administrative authority where the damaging consequences occur does not have the right to penalize the violator. Second, the environmental protection fee is not the full compensation for state-owned environmental resource loss. Nowadays, charges related to environmental protection in China include pollution charges, ecological compensation fees,
resource usage fees, or resource taxes. Even though some of these charges may be compensatory penalties rather than administrative fees, they may not cover all of the costs of environmental damage. For example, while the pollution charge takes the form of compensation, the charge is set based on management costs and takes account of polluters’ capacity to pay. As such, these charges cannot fully account for the environmental damage.\footnote{For instance, according to the 2004 Green National Economic Accounting Report of China, which was co-issued by the State Environmental Protection Bureau and the State Statistical Bureau on September 9, 2006, the total loss caused by environmental pollution in 2004 was 511.8 billion yuan. According to the 2004 Annual Report on Environmental Statistic, which was issued by the State Environmental Protection Bureau, the total collected pollution fees were only 9.4 billion yuan, less than 1.84% of the total pollution loss. \textit{Wang Jinnan et al., China Green National Economic Accounting Study Report 2004}, at 11 (2006), available at http://www.caep.org.cn/english/paper/China-Environment-and-Economic-Accounting-Study-Report-2004.pdf (co-issued by State Environmental Protection Bureau and State Statistical Bureau).} Article 12, Paragraph 2 in the Regulations of Sewage Charges Collection and Use, promulgated by the State Council in 2003, clearly states that polluters pay pollution charges, but the payment does not exempt them from the responsibility to prevent pollution and compensate for losses, as well as the other responsibilities required by laws and administrative regulations.\footnote{Pai Wu Fei Zheng Shou Shi Yong Guan Li Tiao Li (《排污费征收使用管理条例》第 12 条第 2 款) [Regulations of Pollution Fee's Collection and Usage] (promulgated by State Council, Jan. 30, 2002, effective July 1, 2003) Article 12, paragraph 2 (China), available at http://www.people.com.cn/GB/shizheng/16/20030117/909481.html.}

Thus, there cannot be a perfect solution for the damage to state-owned environmental resources. The legal protection of property rights includes administrative remedies, civil remedies, and criminal sanctions.\footnote{Discussion of the role of criminal sanctions is beyond the scope of this paper.} None of them can provide complete protection; however, these three liabilities are designed to be complementary. Civil remedies for the damage to state-owned environmental resources are indispensible. If the subject of state property rights ignores these means, it does not completely fulfill its duty to protect state property rights. Civil remedies can be realized through judicial and non-judicial processes. When the problem cannot be solved through non-judicial processes, authorities may turn to legal channels. No law rules out the administrative authority’s right to claim civil remedies through legal channels.

A civil remedy for environmental resource damage has several features, one of which is that the remedy corresponds with the loss and is not subject to the restriction of administrative jurisdiction and executive power. A civil remedy can make up for the deficiency of administrative measures and is especially applicable to sudden, unpredictable, or trans-jurisdictional
circumstances. A civil remedy treats state-owned resources and environmental resources of other subjects as having the same status, which helps address the problems of the unfettered encroachment upon, unreasonable use of, and lack of care towards natural resources.

At present, China’s Mineral Resources Law, Forest Law, Grassland Law, Marine Environmental Protection Law, and other legislation have stated that one who destroys state environmental resources must compensate for the State’s loss. In addition, according to Article 41 of the Environmental Protection Law, “a unit that has caused an environmental pollution hazard shall have the obligation to eliminate it and make compensation to the unit or individual that suffered direct losses.”27 The article also includes regulations on compensation for state-owned environmental loss because the “units and individuals” include all legal subjects.28

2. Clarifying the Subject Representing State Environmental Resources and Interests

In accordance with the Chinese Law, the State is the only subject of state-owned environmental resources.29 There is no classification of ownership, but the management of state assets will apply the principle of unified policy and management at different levels.30 Management at different levels is, in fact, exercising state ownership through all local governments and their authorized agencies. In other words, they participate in civil and management activities as owners. Undoubtedly, the representative of the state’s environmental resources should be the government and its administrative departments. The problem is resolving which sector of government should represent the resources. Can the same department represent economic and ecological values? If not, which other

28. Id.
29. Id.
department can represent these values? Furthermore, which levels of
government in the region can represent these interests?

The Marine Environmental Protection Law is the only law stating
which agency can represent the State’s claim for compensation of
environmental resource damages. Article 90, Paragraph 2 states that:

For damages to marine ecosystems, marine fishery
resources and marine protected areas which cause heavy
losses to the State, the department invested with power by
the provisions of this law to conduct marine environment
supervision and administration shall, on behalf of the State,
put forward compensation demand to those held
responsible for the damages.31

According to the Marine Environmental Protection Law, Article 5, the
competent administrative departments in charge of environmental
protection under the State Council include the State Oceanic Administrative
Department, the State Administrative Department in Charge of Maritime
Affairs, the State Fishery Administrative Department, the Environmental
Protection Administrative Department, and the Environmental Protection
Department of the Armed Forces; all hold certain responsibilities for the
supervision and administration of marine resources.32 With so many marine
environment supervision and administration departments, it is still unclear
who can represent the State’s marine environmental resources.

The management of China’s natural resources is based on the natural
resource’s classification.33 The department in charge of the resource, as a
special administrative body, exercises the competent management function.
But the government functions as a general administrative body, and other
administrative departments function as auxiliary natural resource
management departments that also have some relevant responsibilities.
Corresponding to its jurisdictional level, each administrative body has a
hierarchical local management institution, which creates a complicated
relationship between resource management administrative agencies. Each
resource has many related management agencies. It is quite difficult to
determine the civil rights subject of the resources in judicial practice.

32. Id. art. 5.
33. See Environmental Protection Law of the People’s Republic of China, art. 7, 9–11
(outlining the different State administrative departments, classified by natural resource type, competent
to manage China’s natural resources).
State environmental resources can be divided into three categories: (1) resources transformed into productive assets, which become state-owned “private property” and, thus, appear to be similar to other forms of private property; (2) resources including land, minerals, water, forests, et cetera under the administration of related departments; and (3) state-owned environmental resources with a significant public property feature, which are not attributed to any independent agency. Such resources include the air and oceans.

When state environmental resources are damaged, three kinds of subjects can claim civil remedies. The first kind of subject is the organization using and managing state-owned environmental resources. Some of the state-owned resources have been transformed into business assets, such as transferred land, permitted exploitation of mineral resources, and leased water areas. They are occupied, operated, and managed by specific agencies, enterprises, and institutions. These specific agencies, enterprises, and institutions have rights and interests in—and undertake obligations towards—the resources they use and manage that are equivalent to the rights they would have if they owned those resources. The subjects also have the right to occupy, use, and dispose of the resources in their possession. When these resources are infringed upon, the subjects can claim compensation for losses in the same way that a private property subject can. The only difference is that they are the subjects of jus in re aliena of the resources, not the subject of ownership, i.e., they hold usufructuary rights in, not ownership of, the resources. The agencies are not eligible to represent the State in civil claims. However, since their rights and interests are closely related to the condition of the environmental resources, when they bring a claim to protect their rights, they also protect the State environmental resources.

The second kind of subject is the environmental resource management department. China has yet to form an integrated management system for environmental resources. Environmental resources are often managed based on different categories, which are determined by the different types of resources, such as forests, wildlife, minerals, grasslands, land, fisheries, and aquatic resources. These resources are managed by the Agencies of Forestry,


Agriculture, Mining, Land Management, and Fisheries Management, respectively. These agencies are obligated to manage and protect their resources and to develop the resources on behalf of the State. They shall supervise users’ behavior, protect the resource’s function, and promote sustainable development. When a particular resource is damaged and the responsible agency is identified, the agency shall assert a civil claim on behalf of the State.

The third subject is the government or department responsible for supervision and management of the quality of environmental resources. When the environmental quality of a specific area is damaged, it is difficult to strictly distinguish the damage to various resources, and the claim is expensive and difficult to separate. Supervision and management responsibilities, such as environmental capacity and environmental quality, have not been clarified on some resources. If responsibility has not been delegated, then the regional authorities responsible for environmental quality would be more appropriate subjects. Article 16 of the Environmental Protection Law stipulates that “[t]he local people’s governments at various levels shall be responsible for the environmental quality of areas under their jurisdiction and take measures to improve the environmental quality.” The article clearly defines the regional authorities responsible for environmental quality. The government must have a certain right to take the responsibility. Rights and obligations are unified. Besides the basic right, the State can claim environmental decision-making rights, environmental management rights, environmental coordination rights, and the right to comprehensively restore the environment. When public environmental resources are contaminated, the government shall have the right to claim losses on behalf of the State. The local government may authorize the environmental protection department at the same level to file claims for compensation.

3. Clarifying the Functions of Administrative Authorities and Prosecutors on Behalf of the State’s Interest in Court

When state environmental interests are harmed, the government departments shall be the first plaintiff. When national environmental resources or public environmental interests are jeopardized, such as when state-owned rivers, oceans, natural fisheries, wildlife, or land resources are polluted, the public institutions are obligated to take relevant administrative and judicial measures to protect state resources and national interests; otherwise, it is a dereliction of duty. Prosecutorial and government departments are both public agencies, but they function differently. The government environmental protection and management departments are the direct bearers of public functions and should first provide relief. The Procuratorate is the legal supervisory organ. When prosecutors find problems, they can redirect those problems to the corresponding administrative authorities and urge them to take action. If the prosecutor acts first, then they will have meddled in other agencies’ affairs by exceeding their prosecutorial duties, which could lead to lazy habits in administrative agencies. Only when the corresponding administrative authorities do not respond or respond inappropriately may the prosecutor file a claim for compensation.

Public institutions shall undertake their responsibilities according to the law. Otherwise, an abuse of power may occur. This applies in situations when prosecutors and governmental departments choose which matters can be sued for and what suit can be initiated—only within the law can they file public interest litigation, and presently such opportunities are limited. Therefore, legislation should be passed as soon as possible to clarify and expand the circumstances when these agencies bring public interest cases.


Through the analysis of the study cases, we can see that defendants have a lot of concerns when facing litigation filed by administrative authorities and the prosecutor. They generally understand that these departments are backed by public power and have the advantage in court, as well as in evidence extraction and investigation. In addition, they might hold an unequal position with other parties in terms of the civil subject relationship. Further, when these departments claim civil compensation,
there may be a conflict between both the public and private right. Though it is not always the case, the defendant’s concerns are reasonable to some extent.

A plaintiff’s standing is an important theoretical issue, but people have no concept of it. In the study cases with disputes over a plaintiff’s standing, all defendants had professional counsel. Surprisingly, there was no dispute of standing in the two public interest cases filed by the Procuratorate, which is an argument that could be expected, given the extensive debate amongst academics and practitioners about the role of the Procuratorate in public interest litigation. There may be several reasons for this: the defendant does not have professional counsel; the Procuratorate and the Environmental Protection Agency have conducted a joint investigation and have solid evidence so the defendant thinks there is no need to argue; or the defendant is scared by the Procuratorate’s power and does not dare to fight against it.

Therefore, the Supreme People’s Court or the High People’s Court should develop appropriate provisions for public interest litigation procedure because it is necessary to protect both the plaintiff’s and the defendant’s substantive and procedural rights equally in such public interest litigation.

II. CONSIDERATIONS OF CLAIM AND REMEDIAL MEASURES

A. Kinds of Claims

Claims are normally classified into three categories: claims for compensation, claims for rehabilitation, and claims for cessation of infringement. Claims for compensation can be further divided into four main sub-categories depending on the different kinds of damages. The first sub-category is damages for existing losses in national environmental resources, including damages for losses in national fishery, aquatic, agricultural, and ecological resources. The second is damages for medium- and long-term loss. It embodies damages for reduction of natural aquatic products, damages for loss in natural fishery resources during the period of environmental restoration, and damages for the restoration costs. The third sub-category is clean-up costs and administrative expenses, which include compensation for oil spill cleanup and pollution costs. In general, these costs provide for cleaning tools, facilities, and labor. The final sub-category is damages for investigation costs. This includes investigation expenses paid by administrative departments and expenses for accident monitoring,
evaluation, investigation, and tracking, which are paid by other institutions entrusted by the administrative departments.

Claims for the removal of obstacles are common in many cases, especially in disputes over oil pollution damage resulting from vessel crashes. However, the claim for the removal of obstacles is, in practice, presented as a claim for cleaning costs, which is different from other civil cases. Oil pollution accidents resulting from vessel crashes are considered to be local emergencies. Once they happen, some relevant executive agencies should respond to it immediately through operations such as disaster relief and pollution cleanup. Therefore, administrative departments carry the burdens of both action and costs. However, according to the polluter pays principle, the polluter should be responsible for the final consequences of remedying the environmental damage.

Claims to cease infringement and to restore original conditions have seldom been made. For instance, a claim for restoration to the original condition only arose in one out of the 14 cases. However, in some cases, a claim for compensation for the medium- and long-term loss and the costs of environmental restoration is the equivalent of a restoration claim in terms of the two claims’ characters. A claim to stop infringement was only made in one case when an illegal emission happened where an inland waterway connected with the sea. This phenomenon is related to the characteristics of the pollution incidents, such as the suddenness of oil pollution resulting from vessel crashes.

**B. The Court’s Position on Certain Claims**

Comparing the claims and the judgments, it is possible to draw the following conclusions. First, the court has normally allowed a claim for compensation, including existing losses in national fishery resources, losses to the economic value of the environment, and the cleanup costs. The value of national fishery resources usually needs to be estimated by professional institutions because they are even more difficult to accurately assess than for farming fisheries. The plaintiffs, in most circumstances, submitted their own evaluation reports in an attempt to support their claim. The court usually admitted the plaintiff’s claim if the defendant did not rebut it or if the rebuttal evidence did not stand.

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40. Marine Env’t Prot. Law of the People’s Republic of China (1999), supra note 2, at art. 41.
41. Id. at art. 73.
Second, the court did not admit most of the claims for medium- and long-term loss. Such a claim was made in seven out of 14 lawsuits. Of these seven cases, it was admitted in two, overruled in four, and undeterminable in one.42 The reasons for overruling the claim include lack of evidence and valid contrary proof provided by the defendant. Even when the claim was admitted, the court restricted the scope of compensation.

Third, investigation expense claims are always admitted if the plaintiff made the claim with adequate evidence. Because external assessors must be used to monitor, investigate, and evaluate the accidents, plaintiffs are responsible for the costs of hiring them. The court held that these reasonable and necessary expenses of hiring evaluation institutions resulted from the pollution. Therefore, the defendant should be liable to compensate these losses. However, in some specific cases, the court overruled compensation claims made by administrations to recover the expenses incurred by implementing their duties on the basis that these costs should be borne by the government.

C. Distribution of Damages

The plaintiff received compensation in seven out of 14 lawsuits studied, but compensation was not awarded in six of the lawsuits. The remaining suit was withdrawn because the plaintiff did not pay the court fee and, as such, it is unknown whether compensation would have been awarded or not. In cases where the receiver of payment and the plaintiff were different, the damages were submitted to the State Treasury, including damages for direct economic loss in national aquatic products and the loss of interests incurred, damages for loss in natural fishery resources and loss of interests incurred, and damages for loss and costs caused by environmental pollution.

Public interest litigation aims to remedy the loss inflicted on national and public interests. Therefore, the damages, apart from compensating the administrations’ costs, should be distributed to remedy the loss inflicted on the country. Submitting the damages to the State Treasury could serve as a way to achieve the goals of public interest litigation.

42. This case was settled by mediation.
D. Analysis and Suggestions

1. Improving the Means and Extending the Scope of Remedies

Oil pollution resulting from vessel crashes poses two kinds of damage to both the national and the public interests. The first is loss in national environmental resources, such as natural fishery resources, algae and mangroves in the coastal sediment habitats, birds, and landscape resources. The second is environmental quality damage, such as seawater quality deterioration, temporary or permanent disappearance of various functions, and reduction of wildlife habitats. In addition to losses in resources caused by pollution, plaintiffs are also gradually bringing claims related to ecological damage, such as marine and coastal pollution, water quality deterioration, sediment pollution, and depletion of tidal flats.

Plaintiffs also described and proved the damage specifically. However, claims for damages were limited to the loss in fishery resources. Although the claim for damages for the medium- and long-term loss presented in some cases required assessment of long-term influence of environmental damage, damage to natural fishery resources was still regarded as the criterion. The main reason was that only the Regulation of the Calculation Method of Fishery Damage in Water Pollution Accidents\(^{43}\) clearly regulated the estimation criteria. The estimated damage to national fishery resources in a polluted water area should be a minimum of three times the loss of direct aquatic production. Cleanup costs normally only include the actual costs incurred by cleaning the surface oil. Except for specific cases, the administrative organs do not claim compensation for ecological restoration. Therefore, there has always been a huge gap between the claim made by the plaintiff and the actual damages to public and national interests.

The court overruled petitions for compensation for ecological damage for the following reasons: the law is still undefined; the lack of a scientific standard of estimation; and the lack of scientific methods of appraisal. Under the General Principles of Civil Law, Property Law, and Tort Law, the scope of damages should include direct loss and indirect loss.\(^{44}\) However,

\(^{43}\) Shui Yu Wu Ran Shi Gu Yu Ye Sun Shi Ji Suan Fang Fa Gui Ding (水域污染事故渔业损失计算方法规定) [Regulation of the Calculation Method of Fishery Damage in Water Pollution Accidents] (promulgated by Agriculture Ministry, Oct. 8, 1996) No.14 Document on Fishery (China).

\(^{44}\) See General Principles of Civil Procedure Law of the People’s Republic of China, supra note 14, at, art. 117, 119 (stating that parties that infringe upon property or cause personal injury must pay or reimburse those affected for cost of the damages and any other great damages, i.e., indirect losses).
there is a lack of an unified understanding about what counts as indirect loss in relation to natural resources damage. While compensation for environmental damage should theoretically be one of the available civil remedies, damage to natural resources is within the scope of damages under Article 91 of the Marine Environment Protection Law.\textsuperscript{45} In addition, calculating environmental damage is also a challenge for the judiciary and governmental agencies because it involves a very large range. As we can see from worldwide legislation (e.g., the Environmental Liability Directive of the European Union, German Environmental Damage Liability Act, and the United States’ Comprehensive Environmental Response, Compensation, and Liability Act), there has been a trend to recognize and regulate the damage to the environment itself within the scope of damages.\textsuperscript{46} Additionally, many countries have increased their efforts to improve the assessments and standards of the damage to the environment itself. Therefore, making relevant laws and drawing up guidelines is an urgent task.

The idea that environmental damage involves “medium- and long-term loss” is not understood as a legal term. It is difficult to place the idea within existing definitions of damages. Currently, the courts and administrative organs have different understandings of this idea in practice. Therefore, it is recommended that this term be defined in the law.

2. Treating Investigation Costs Differently

Under Article 5 of the Marine Environment Protection Law of the People’s Republic of China, the administrative departments of environmental protection, such as oceanic, maritime, and fishery affairs departments, all have certain responsibilities to supervise and control pollution of the marine environment, as well as investigate and treat ocean pollution accidents.\textsuperscript{47} The administrative departments have a statutory duty...
to investigate and treat pollution accidents; that is paid for by the government, not the polluters. Thus, it is critical to differentiate the two kinds of claims concerning compensation for the costs spent on investigation: compensation for the losses incurred by the administrative departments’ investigation versus the compensation for the costs of technical services provided by the third parties that were hired by the administrative departments. The former should not be imposed on the violator, but the latter, so long as they are reasonable, can be shifted to the violator.

3. Improving the Regulation of Damages Distribution

A proper system for regulating the distribution, management, and use of damages should be developed and legally identified in order to prevent the administrative departments from abusing and embezzling the damages. In an attempt to compensate the depletion, reduction, and devaluation of the resources owned by the state, the damages should be submitted to the State Treasury. The damages for environmental restoration should be used for supervise the nation-wide marine environment protection work and be responsible for preventing and controlling marine pollution damages caused by land-based pollutants and coastal construction projects.

The State oceanic administrative department shall be responsible for the supervision and control over the marine environment, organize survey, surveillance, supervision, assessment and scientific research of the marine environment and be responsible for the nation-wide environment protection work in preventing and controlling marine pollution damages caused by marine construction projects and dumping of wastes in the sea.

The State administrative department in charge of maritime affairs shall be responsible for the supervision and control over marine environment pollution caused by non-military vessels inside the port waters under its jurisdiction and non-fishery vessels and non-military vessels outside the said port waters, and be responsible for the investigation and treatment of the pollution accidents. In the event of a pollution accident caused by a foreign vessel navigating, berthing or operating in the sea under the jurisdiction of the People's Republic of China, inspection and treatment shall be conducted on board the vessel in question. Where the pollution accident caused by a vessel results in fishery damages, the competent fishery administrative department shall be invited to take part in the investigation and treatment.

The State fishery administrative department shall be responsible for the supervision and control over the marine environment pollution caused by non-military vessels inside the fishing port waters and that caused by fishing vessels outside the fishing port waters, be responsible for the protection of ecological environment in the fishing zones, and shall investigate and handle the fishery pollution accidents other than those specified in the preceding paragraph.

Id.
future control and restoration work. In general, the local administrative departments, which are responsible for environmental quality, should organize all projects and earmark specified amounts of money to be spent on particular projects. To better manage the money, the local administrative departments should establish an environmental protection fund for receiving and controlling fines and compensatory damages.

III. OBSERVATION OF THE BURDEN OF PROOF AND DAMAGE EVALUATION

A. Allocation of the Burden of Proof

Regarding the allocation of the burden of proof in the pollution cases, the way that the Maritime Court applies the law is relatively appropriate. The court strictly adhered to the relevant regulations in handling all of the 14 cases.

1. The Burden of Proof Regarding Causation Between the Act of Pollution and Damage

The court adopts the doctrine of the presumption of causal relation with regard to the proof rule on causation between the act and damage. In the cases of oil pollution, it is comparatively easy to find a causal relationship between the pollution and damage. The damage caused by oil leakage is visible and can be assessed by various means. Therefore, a defendant needs only to demonstrate the fact that there has not been oil leakage to disclaim his responsibility. As a matter of course, most of the disputes arise not from the causation between the pollution and the damage, but from the pollution and the severity of damage caused by the pollution.

However, in cases where pollution happened in inland waterways connected with the sea, the issue of causation is not as conspicuous as in other cases. In these cases, the court adopts the doctrine of the presumption of causal relation, where the defendant has the burden of showing there is no causal relationship between the act and the pollution. If the defendant fails to meet this burden, then causation is established. The court applies the third paragraph of Article 4 of some Provisions of the Supreme People’s Court on Evidence in Civil Procedures, which asserts that the burden of proof lies upon the tortfeasor to prove the existence of legal exemptions or to show there is no causal relationship between the act and the resulting
damage.48 Hence, those defendants who fail to disclaim the causation relating their acts of pollution and the damages have to bear the unfavorable result.49

2. The Burden of Proof Regarding Damages

In oil pollution cases, as an exception to the general rule, the allocation of the burden of proof inverts regarding causation. However, in other aspects, these cases abide by the general principle of the Civil Procedure Law where the burden of proof lies upon the party asserting the claim.

In the Number 150 Writing Verdict of the Marine Affair of Guangzhou Maritime Court of 1999, the court decided that, according to Article 74 of Some Opinions of the Supreme People’s Court on Applying Civil Procedure Law of People’s Republic of China, the defendant does not have the burden of proving the actual composition of the damages.50 For this reason, unless expertise is needed to assess the actual composition of damages, the plaintiff should be responsible for proving their claim.

Nine out of the 14 cases involved the evaluation of damages to the marine environment, in which the plaintiff offered a commissioned evaluation report. Defendants have always questioned the validity of this report, which is made by a qualified institution (not the plaintiff itself). In very few cases, defendants also render their own report. In such a circumstance, the court has to rule based on the facts and the authority of the institutions that have made the reports. The court will recognize a report as proof of oil-polluting damage if a competent institution makes the report upon a sound scientific basis, unless there are sufficient facts to prove otherwise.

In cases in which the plaintiff introduces a supporting report, the defendant often refutes the report as not qualified on the ground that the claimants and the institutions have common interests. Under these circumstances, the court will admit the report as adequate proof if it


considers that the defendant, not the experts themselves, failed to present sufficient rebuttal evidence.

On the other hand, for cases in which both the plaintiff and defendant introduce an evaluation report, the court utilizes the following methodology to choose the most persuasive report. The court sets priority for the report with the most clarity and the most reasonable evaluation methods, and then it will take into consideration the rank and prestige of the evaluating institutions.

On balance, owing to the immense amount of liability for damages resulting from marine pollution, it would be unfair and detrimental to the defendant if the court wrote its verdict totally based on the report the plaintiff introduced. It is terribly difficult to collect evidence during the trial because of the temporary character of most of the pollution. Therefore, the defendant should actively preserve the evidence and entrust a qualified evaluation institution to appraise the pollution immediately after the pollution occurs. On the other hand, third parties, such as governmental departments managing the marine environment, should carry out their duty to participate in the investigation concerning the pollution so they can assist the court in collecting evidence during the trial. It is understood that evidence provided by third parties, judicial identification centers, is credible. In the end, if there are obvious inconsistencies among the reports provided by the plaintiff, then the defendant, and the third parties should be commissioned to review the plaintiff’s report and issue their authentic Opinion on the Review of Judicial Identification. Although this methodology is based on the plaintiff’s report, it could protect the defendant’s rights, to some extent, by scrutinizing the validity of that report.

B. The Evaluation of Damage

Of the 14 cases chosen, eight involved evaluation institutions, three were closed by mediation, and the other three cases were claims for cleansing and investigation fees. We can conclude the following after the analysis of these cases.

1. The Evaluation Institutions and the Plaintiff Have a Close Relationship

The survey revealed that most of the institutions commissioned by the plaintiff are environmental monitoring centers or institutes of

environmental science, some of which are directly subordinate to the administration and some of which are not subordinate but still have intimate relations with the administration. Moreover, they provide technical services for the maritime resources administrative department. The defendant seldom commissions these institutions. If they do, most of the institutes used are not local or have no relationship with the local administration, which demonstrates the defendants’ suspicion towards local institutions.

2. There are Many Disputes Over the Evaluation’s Findings

Defendants in six out of the eight cases involving the evaluating institutions raised an objection to the evaluation report, so the rate of dissent is 75%. In one case, the defendant neither appeared in court to respond to the lawsuit nor objected to the evaluation. Only one case failed to raise an objection at all. Among those dissents, three complained about the methodology of evaluation, three complained about the objectivity of the institutions, and two questioned the validity of the report.

3. The Plaintiff’s Report Has Priority

Three reports offered by the plaintiff were fully recognized and five were partially recognized. All of the defendants’ reports failed to serve as sufficient rebuttal evidence, and, in a few cases, they merely partially rebutted some of the plaintiff’s claims. The plaintiff commissions evaluation institutions to investigate and monitor because these reports are instantaneous and impartial. Additionally, the reports always outweigh the defendants’ reports in terms of particularity and adequacy. Therefore, the court is inclined to admit them.

C. Analysis and Suggestions

1. Enhancing the Rules and Methodology of Evaluation

Damages regarding aquaculture products (short-term and long-term loss of natural fishing resources) have been evaluated by the fishery environmental monitoring institution entrusted by the Fishery Administration. The commissioned institutions have a close relationship with the plaintiff, which leads to skepticism concerning their credibility because their evaluation reports often exaggerate the loss, and the reports themselves are similar for different cases. The identification of damages is always time-limited; therefore, the report commissioned by the court, in varying situations, is very hard to magnify as qualified evidence to rebut an
opposing report. But if the plaintiff’s report is not recognized, then there is no basis upon which the court can render its judgment regarding damages. A dilemma arose thereafter as to whether the court can recognize the monitoring report as the foundation for evaluating damages.

By far, it would seem to be impossible to deploy a third party’s evaluation. In order to ensure the objectivity of the evaluation, some changes can be made, such as improving the rules and methods for evaluations. Therefore, the government should make rules regulating the ways in which environmental damages are evaluated, thus instructing and supervising the conduct of evaluation.

2. Exploring the Establishment of Specific Institutions for Evaluating Environmental Damages

The existing institutes that evaluate and monitor environmental pollution are varied in their qualifications. For instance, some are only qualified to monitor the environment and some are only qualified to appraise the loss to fisheries. Owing to the particularity of environmental damage, it is necessary to establish professional environmental damage evaluation institutions to carry out the task of supporting remedies for environmental damage.

CONCLUSION

Environmental pollution public interest litigation is a crucial step toward the modernization of China’s environmental law. Confronted with immature legislation and the absence of related regulations, judges who hear these kinds of cases should have great courage and innovative spirit. That way, China’s environmental public interest litigation will reflect the emergence of judicial activism in the courts. The Guangzhou Maritime Court’s interpretive identification of the plaintiff’s standing is of judicial and legislative referential significance, especially in terms of the innovation of the remedy for public interest infringement. In the meantime, judicial practice of environmental public interest litigation exposes some defects and obstacles in legislation and environmental law theory. Since the ownership of environmental resources and the representative of environmental public interests are not clear, the subject of a remedy for environmental damage is always absent or in a state of disorder. Because the law regulating the scope of damage and the methodology to identify the loss are vague, the public interest of the environment has not been fully protected by law. Because rules on environmental public interest litigation
are too obscure, litigation has rendered itself an obstacle for common citizens and environmental protection groups seeking a remedy.

Above all, society is still afraid of defying the authority of the government, which leads to citizens’ reluctance towards bringing administrative lawsuits to defend their environmental interest. Therefore, we need to further inform the public of the functions and the significance of environmental public interest litigation. To earn credibility among the public, we should fully explore the possibility of filing more public interest litigation based on the current regulations and legal system.

Therefore, from a long-term perspective, we must amend the related laws and regulations with the following goals in mind: establish environmental rights for every citizen as the basis of public interest litigation legislation; ensure the representation of environmental public interests as the basic premise of the legislation; and improve public interest litigation legislation in different levels to include the Constitution, laws, judicial interpretations, and other legal regulations.
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INTRODUCTION

Many countries are exerting active efforts to address climate change as human beings face its stern impacts.¹ In 1992, the United Nations Framework Convention on Climate Change (UNFCCC) adopted “mitigation” and “adaptation” as the major measures for addressing climate change.² “Mitigation” refers to member states using so-called “preventative responses,” either reducing greenhouse gas emissions or increasing greenhouse gas sinks, to prevent climate change.³ “Adaptation” refers to measures, also called adjustment responses, which may reduce the actual or prospective negative effects of climate change on human beings by strengthening the adaptability of ecological and social systems.⁴

Currently, there are three major channels to control or reduce greenhouse gas emissions: first, improving energy efficiency and energy conservation; second, developing renewable energy; and third, applying the technology of carbon sequestration.⁵ Because one of the major channels for greenhouse gas emissions reduction is the development and use of renewable energy and the enhancement of the proportion of renewable energy in the energy production and consumption structure, many UNFCCC members placed an emphasis on renewable energy policies and

¹ See generally, Kyoto Protocol to the United Nations Framework Convention on Climate Change, U.N. Doc FCCC/CP/1997/7/Add.1 (Dec. 10, 1997) [hereinafter Kyoto Protocol] (The Kyoto Protocol sets out detailed emissions reduction targets and has been ratified by 192 out of 212 countries.).
³ DAVID HUNTER, JAMES SALZMAN & DURWOOD ZAELKE, INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 650 (6th ed. 2007).
⁴ Id.
laws designed to promote renewable energy development and use.\textsuperscript{6} As a member of the UNFCCC and the Kyoto Protocol, China promulgated the \textit{Renewable Energy Law} and a series of policies to create a framework of systems to uphold its international responsibilities. These actions show China's clear attitude and determination to actively address climate change.\textsuperscript{7}

The main objective of this article is to look back into the history of the Chinese framework of laws and policies on renewable energy as well as to introduce the current situation and problems systematically in order to show how addressing climate change gradually became an integral part of China's renewable energy strategy. Furthermore, the article points out the problems as well as future direction of the Chinese legal system for renewable energy. This article is divided into three parts. Part 1 details the development process of the Chinese legal system for renewable energy and deeply analyzes the intrinsic relations between the legal system development for renewable energy sources and climate change. Part 2 introduces several main systems and their implementation status in the Chinese legal system for renewable energy. Part 3 introduces the principal problems of the Chinese legal system for renewable energy and suggests how to resolve these problems under the background of climate change.


\textsuperscript{7} Quan Guo Ren Min Dai Biao Da Hui Chang Wu Wei Yuan Hui Huan Jing Yu Zi Yuan Bao Hu Wei Yuan Hui, Guan Yu <Zhong Hua Ren Min Gong He Guo Ke Zai Sheng Neng Yuan Fa> (关于《中华人民共和国可再生能源法》 (草案征求意见稿) 的说明) [NPC Environmental and Resources Protection Committee, Instructions for the Draft of Renewable Energy Law of China] (2004), available at http://www.l.creia.net/cms/upload_file/news/63331011b6e467d3c7d20bebbe8ba0d.doc (stating that Chinese officials believe that China needs to undertake international obligations according to China's international status and level of economic development to reduce the proportion of fossil fuels in the energy consumption structure, and that the development of renewable energy is very important for China to achieve that goal).
I. INFLUENCE OF CLIMATE CHANGE ON THE PROGRESS OF POLICIES AND LAWS ON RENEWABLE ENERGY IN CHINA

A. Prior to UNFCCC: The Policies and Laws on Renewable Energy are Almost Vacant

From 1949 to 1992, the basis for Chinese energy industry was so weak that China mainly focused on conventional energy development during this period. Through enforcing several five-year plans gradually, China developed petroleum, coal, and electric power vigorously. Developing renewable energy was mainly for the purpose of rural energy construction instead of replacing conventional energy.

Concerning the adjustment mechanism, before 1992 China had been implementing the planned economy, in the field of energy China adjusted mainly by the plans and the policies. So during that time the adjustment for renewable energy development mainly depended on related policy but not the legal regulative mechanism.

The policies on renewable energy were made mainly for the purpose of rural energy construction. For instance, the *Opinions on Strengthening Rural Energy Construction*, issued by the former National Economic Commission in 1986, stated when all provinces, autonomous regions, and municipalities directly under the Central Government compiled their long-term plan for the development of rural energy, the plan should include “the research, development, and popularization plan for: firewood-saving cooker, methane, forest energy, small hydroelectric power, small thermal power, small coal mine, straw utilization, solar energy, wind energy, geothermal energy, ocean energy, a plan for energy use (including commercial coal, power and oil supplied to township enterprises), and energy conservation in rural areas.”

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9. Guo Jia Jing Ji Wei Yuan Hui Guan Yu Jia Kuai Nong Cun Neng Yuan Jian She De Yi Jian (国家经济委员会关于加快农村能源建设的意见) [Former National Economic Commission, Opinions...
as “firewood-saving cooker,” “small hydroelectric power,” and “small thermal power” are only suitable for countryside use.

During this period, the funds put into the field of renewable energy were mainly used to develop renewable energy technology and utilization in the countryside. For example, every year during the 7th Five-year plan period, the Finance Ministry gave the financial allocation to develop the countryside energy; in the 7th Five-year technology research plan, the State Planning Commission provided funds for the research and development of renewable energy technology, and every year, provided a three million renminbi (RMB) loan to support the energy industry development in the countryside. Further, the Economic Committee gave support to renewable energy construction.10

After twenty years, renewable energy development in China has been quite magnificent and established the foundation for the country’s renewable energy technology and industry. By the end of 1993, more than 60,000 medium and small-sized hydroelectric power stations were operated in different cities, and large and medium-sized methane projects supplied gas to 84,000 families intensively. The heat utilization technology of solar energy has been changed into small scale production in varying degrees. The photovoltaic power generation of solar energy has made certain progress. The installed gross capacity of wind power generation has amounted to 26,000 kilowatts (kW).11


After the 1990s, three major factors laid the foundation for China’s formulation of macro policies on the development and utilization of renewable energy. First, in 1992 China began to vigorously develop a market-oriented economy. Rapid economic development provided the material basis for the development of renewable energy. Second, Because of the rapid economic development, heavy consumption of traditional fossil...
energy has made pollution (especially air pollution) more and more serious. China saw the need to develop and utilize clean renewable energy. Third, member commitments under the UNFCCC required that all member states try their best to reduce greenhouse gas emissions. China issued a series of policies and laws on renewable energy after 1990 due to the combined impacts of these three factors.

On the policy level, on March 25, 1994, the State Council passed the 21st Century—White Paper on Population, Environment and Development, that pointed out “China will develop an energy industry based on coal and centering on power, actively explore petrol and natural gas, appropriately develop nuclear power, and develop new energy and renewable energy according to the local conditions.” On January 5, 1995, the former National Planning Commission, the former National Science Commission, and the former Economic and Trade Commission put forward the Guidelines for the Development of New Energy and Renewable Energy in China (1996-2010). This guideline presented in detail the problems of the renewable energy that existed in China at that time, and the future development target as well as relevant solution measures. This document was the guiding document directing the development of new energy and the renewable energy industries in China at that time.

On the other hand, China also released concrete and operable department rules and regulations. The Ministry of Power Industry

15. Lun Neng Yuan Zhan Lve Yu Neng Yuan Gui Hua De Fa Lv Jie Ding (论能源战略与能源规划的法律界定) Xiao Guoxing, Legal Orientation of Energy Strategy and Energy Planning, 42 JOURNAL OF ZHENGZHOU UNIVERSITY 69 (Philosophy and Social Sciences Ed.) (2009) (The energy policy can be divided into two types in China. One is the highest level of guiding policy, which is generally made to energy strategy, such as Guidelines for the Development of New Energy and Renewable Energy in China (1996–2010). This belongs to the strategic energy policy that can determine the direction of development of the entire country in the field of energy. The other type is specific deliberated and coordinated national plans for the future, such as Provisions on the Grid-connection and Administration of Wind Power Plant Operation. Professor Xiao thinks that energy strategy occupies the highest position among a country's energy countermeasures system, energy planning and energy law should be subject to energy strategies, and energy planning is embodied in the energy strategy of a certain period of time. Therefore, the significance and role of the above-mentioned policy documents are expressing a certain period of national energy strategy and determining the direction of development. This role is the macro sense, rather than microscopic, specific utility.).
promulgated Provisions on the Grid-connection and Administration of Wind Power Plant Operation (trial) on July 26, 1994. The primary coverage of this provision is as follows. First, it makes the Ministry of Power Industry the department in charge. Second, it requests the electric administration section purchase the electric quantity completely. This is the beginning of the full guarantee purchase system. Third, it requests wind power plants satisfy certain technical standards, such as automatic monitoring systems to guarantee the safety of grid. Lastly, it pegs the electricity price for wind power plants to cost, interest, and reasonable profit. In addition, areas with higher than the average electricity prices are subsidized by the whole network jointly. This provision is the rudimentary form of a classified fixed grid price system and expenses distribution system. Generally speaking, this stipulation is simple but useful in practice.

On the legal level, the Law on Science and Technology Progress of 1993 was praised by experts, who said that “renewable energy enterprises and projects would benefit to a considerable degree” from this legislation. Two provisions from this law, Article 25 and Article 46, are particularly significant. According to Article 25, “preferential policies stipulated by the State shall be applied to the enterprises and the research and development institutions engaged in the development and production of high-tech products.” Moreover, Article 46 says that “the State shall encourage enterprises to increase the investment in research and development and in technological innovation. The technological development expenditure of enterprises shall be entered into the account as cost in its actual amount.” Article 46 meant that investments made in research and development were exempt from corporate income tax, and thus played a proactive role in the development of solar energy and methane enterprises.

In 1998, the production capacity for solar water heaters amounted to 4,000,000 square meters. Total installed capacity of solar water heaters

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18. Id. at ch. 4, art. 46.
19. Zhong Hua Ren Min Gong He Guo Qi Ye Suo De Shui Zan Xing Tiao Li (中华人民共和国企业所得税暂行条例) [Provisional Regulations on Corporate Income Tax of People's Republic of China] (promulgated by the Ministry of Finance, effective Oct 13, 1993 ) art. 6 (China), (“In addition to the provisions of Paragraph 2 of this Article, deduct the other project, in accordance with the laws, administrative regulations and relevant state regulations on tax.”).
amounted to 15,000,000 cubic meters, first in the world. In addition, the applications areas for solar batteries and solar energy power generating systems expanded continuously: the production capacity for solar batteries in 1998 amounted to 4.5 megawatts (MW). The wind industry also grew from 1990 to 1998. The average annual growth rate of wind power plants surpassed 60% and the installed gross capacity in 1998 amounted to 224,000 kW. Geothermal and biomass energy also developed rapidly during this period.20

To summarize, China formulated several policies and laws on renewable energy in this phase of its development. Still, it is evident that China’s policies and laws were sporadic, and focused primarily on addressing air pollution and resolving the problem of rural energy supply.


Seeking to limit greenhouse gas emissions and counteract global warming, the UNFCCC adopted the Kyoto Protocol during its third session in December 1997.21 The Kyoto Protocol, which sets the schedule of greenhouse gas emissions reductions for developed countries,22 had obvious impacts on policies and legislation in the countries subject to its emissions reductions. The European Union and its member states, such as the United Kingdom, Germany, and Spain, took the lead in promulgating legislation and promoting the development of renewable energy.23


21. See Kyoto Protocol, supra note 1, at art. 2.

22. Id. at Annex B.

Although China, as a developing country, had no specific duty to reduce emissions under the framework of the Kyoto Protocol, it could still engage in the certified emissions reduction trade with developed countries through the Clean Development Mechanism (CDM). \footnote{See Kyoto Protocol, supra note 1, at art. 12.} The CDM not only assisted developed countries in meeting emission reduction targets, but also encouraged China’s enterprises to develop low-carbon strategies. \footnote{The World Bank, Clean Development Mechanism in China xii (2nd ed. 2004).} After the adoption of the Kyoto Protocol, China amplified renewable energy production and formulation of relevant policies and regulations. With regard to policies, the \textit{Circular on the Issues of Further Supporting the Development of Renewable Energy (Circular)} specified that renewable energies include wind power, solar photovoltaic power, geothermal power, and ocean power generation. \footnote{Guo Jia Ji Wei 、 Ke Ji Bu Guan Yu Jin Yi Bu Zhi Chi Ke Zai Sheng Neng Yuan Fa Zhan You Guan Wen Ti De Tong Zhi （国家计委、科技部关于进一步支持可再生能源发展有关问题的通知） [Regulations Title State Planning Commission, Ministry of Science and Technology on Further Support for Renewable Energy Development-Related Issues] (promulgated by Ministry of Science and Technology/National Development and Reform Commission (including the former State Development Planning Commission, the former State Planning Commission), Jan 12, 1999, effective Jan. 12, 1999) (China), available at http://vip.chinalawinfo.com/newlaw2002/slc/slc.asp?db=chl&gjid=23113.} It further specified that for renewable energy projects, the bank shall give priority to the arrangement of basic construction loans. \footnote{Specifically speaking, this circular stipulated that the State Planning Commission will assist the owner of the large and medium-sized renewable energy electricity generation projects, which amount to more than 3000 kW, to obtain the bank loan. The renewable energy electricity generation projects whose capital construction loans were arranged by the bank enjoy a two percent fiscal interest discount; the central project pays by Ministry of Finance, and the local project pays by the local finance. The discounts use the form of “Pay first and discount next.” The enterprise pays the loan interest to the bank first, then what was subsidized by the state. (The discount is one kind of hidden subsidy; virtually, it just provides the subsidy to the enterprise’s cost and price, which is important to support the enterprise’s development.)} During the repayment period for renewable power projects connected to the state grid, the pricing principle of “repayment of principal and interest plus reasonable profits” shall apply, and if that causes the price to go above the average power price of the grid, any such increase shall be distributed across the whole grid. \footnote{The advanced place for this circular compared with pricing system stipulated in the \textit{Provisions on the Grid-connection and Administration of Wind Power Plant Operation (trial)} is that it stipulated the profit margin of investment repayment time for both the imported equipment and domestic equipment. The profit margin of investment during the repayment period for the renewable energy incorporation electricity generation project, which is using foreign power generation equipment, does not exceed the corresponding loan rate at that time plus three percent as principle. The state encouraged}
provided a good incentive mechanism for the development of renewable energy in China.

In addition to the policy incentives created by the Circular, the Main Points for New Energy and Renewable Energy Industries Development and Planning (2000–2015) (Main Points) of 2000 articulated goals and outlined a plan for developing renewable energy.29 The Main Points defined the development objectives of new energy and renewable energy industries, prospective benefits analysis, restrictive factors, and existing problems.30 The Tenth Five-Year Plan for the Development of New Energy and Renewable Energy Industries of 2001 clearly stated Chinese objectives, key points, policies, and measures adopted in the development of new energy and renewable energy for 2001 to 2005.31

With regard to laws, the most important event occurred when the Renewable Energy Law was adopted by the Standing Committee of the National People’s Congress on February 28, 2005 by an overwhelming majority.32

renewable energy power generation projects to use domestic equipment, and the profit margin of investment which is using domestic power generation equipment is no less than the corresponding loan rate at that time plus five percent as principle. If the projects use the domestic equipment, then the profit rate is higher, the cost is lower, and the power price is the same as using the imported equipment—so it can improve domestic renewable energy development.


30. Id. As the first promotion plan specializing in renewable energy industry development, this plan showed the significance of the renewable energy industrial sector in China, and played a guiding role in the development of the renewable energy industry in the Tenth Five-Year period. However, due to the explosive development of renewable energy industry since 2005 the plan was no longer satisfactory. The utilization of renewable energy originally set out in the plan was equal to 25 million tons of standard coal in 2010, up to 1.25% of the total energy consumption. In 2010, the amount actually reached was 300 million tons of standard coal, 9.6% of that year’s total energy consumption. Therefore, China is making active preparation for guidance of the new energy industry development in 2012 to 2020 in The Plan for Development of New Energy Industry.


32. Zhong Hua Ren Min Gong He Guo Ke Zai Sheng Neng Yuan Fa Jie Du (中华人民共和国可再生能源法解读) Junfeng Li, Zhongying Wang, Second Preamble to INTERPRETATION OF THE LAW OF THE PEOPLE’S REPUBLIC OF CHINA ON RENEWABLE ENERGY. (Aug. 2005 ed.) (The whole course, from listed legislative planning to final adoption for Law on Renewable Energy, was only eighteen months. Many persons think “it shows that the national legislative authority and relevant authorities keep the high consistence on the consciousness of the law, and the consistence
With the promulgation of the *Renewable Energy Law*, the development and utilization of renewable energy stepped into the orbit of China’s legal system. The Kyoto Protocol was ratified less than a half-month prior to the promulgation of the *Renewable Energy Law*. Of course, the timing was not entirely coincidental, but was related closely to other factors, such as “the close concern of [the] international society on the issue of climate change.” However, the *Renewable Energy Law* failed to list the “response to climate change” as a major legislative objective, only declaring, “in order to add to energy supply, improve the energy structure, safeguard energy security, protect the environment, and realize the sustainable development of the economy and society.” It was evident that the legislators’ ideas of the role of renewable energy were still limited when the *Renewable Energy Law* was promulgated.

Thanks to strengthened Chinese policies promoting renewable energy and legal governance on development and utilization of renewable energy, new energy industry development in China came into a regulatory stage in that period and gained a great achievement.
Table 1: The development indicators and the achievement of renewable energy during the period of Tenth Five-Year plan

<table>
<thead>
<tr>
<th>Contents</th>
<th>2000</th>
<th>The target of Tenth Five-Year plan</th>
<th>2005</th>
<th>Average growth rate per Year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator electricity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Hydropower</td>
<td>7935</td>
<td>10000</td>
<td>11000</td>
<td>6.7</td>
</tr>
<tr>
<td>2. Grid power</td>
<td>34</td>
<td>120</td>
<td>126</td>
<td>30</td>
</tr>
<tr>
<td>3. Small off-grid power</td>
<td>15</td>
<td>5.3</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>4. Photovoltaic power</td>
<td>1.9</td>
<td></td>
<td>200</td>
<td>3</td>
</tr>
<tr>
<td>5. Biomass power</td>
<td>170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methane (100 million cubic meters)</td>
<td>35</td>
<td>40</td>
<td>80</td>
<td>18</td>
</tr>
<tr>
<td>The rural household biogas (1000 households)</td>
<td>850</td>
<td>1000</td>
<td>1800</td>
<td>16</td>
</tr>
<tr>
<td>Heating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Solar water heater (million square meters)</td>
<td>2600</td>
<td>6300</td>
<td>8000</td>
<td>25</td>
</tr>
<tr>
<td>2. Geothermal (million tons of standard coal/year)</td>
<td>120</td>
<td>200</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Fuel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Fuel ethanol</td>
<td></td>
<td></td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>2. Biodiesel</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>The total utilization (million tons of standard coal/year)</td>
<td>12000</td>
<td>13600</td>
<td>16600</td>
<td>6.7</td>
</tr>
</tbody>
</table>

D. From the Effective Date of Kyoto Protocol in February 2005 to the End of 2008: The System of Renewable Energy Policies and Laws was Established at the Preliminary Level.

Like other developing countries, China is not compelled to restrict its emissions by the Kyoto Protocol. Still, the Kyoto Protocol is one of

37. Kyoto Protocol, supra note 1, at art. 11 (showing that China is a non-Annex-I country under the Kyoto Protocol, thus it is not liable for specific emissions reductions like developed Annex-I countries).
several factors that imposed pressure on China to heighten its renewable power development. For example, Scott Barrett stated:

The logic of the Kyoto Protocol goes something like this: The Kyoto Protocol was intended to be a first step. It requires small (about 5 per cent, on average) reductions in the emissions of industrialized (Annex I) countries for a short period of time (2008–12). Kyoto was to be followed by a sequence of other agreements—a second step, a third step, and so on—with each new agreement progressively lowering the limit on the emissions of Annex I countries. It was expected that, in time, the non-Annex I countries would also agree to limit their emissions. Eventually, it was hoped, every country would be subject to an emission cap.38

In fact, the international debate over countries’ liability for emissions reductions continued even after the Kyoto Protocol took effect.39 The international society is commonly concerned about China’s attitude towards addressing climate change because China is a large contributor of global carbon dioxide emissions.40 In addition, China is confronting both severe air pollution and the age of high oil prices.41 Such factors contribute to China’s strong desire for the development and utilization of renewable energy.

39. See “Gong Tong Dan You Qu Bie De Ze Ren” Yuan Ze De Jie Du——Dui Ge Ben Ha Gen Qi Hou Bian Hua Hui Yi De Leng Jing Guan Cha (“共同但有区别的责任”原则的解读——对哥本哈根气候变化会议的冷静观察) Xiaogang Wang, The “Common But Differentiated Responsibilities” Principle: An Observation on the Copenhagen Conference on Climate Change, 20 CHINA POPULATION, RESOURCES AND ENVIRONMENT 31 2010 (The argument between developing countries and developed countries centered on the “Common but Differentiated Responsibilities” Principle on the Copenhagen Conference on Climate Change. Developing countries, such as China and India, insist that developed countries should assume higher responsibilities, while developed countries think that the Kyoto Protocol should be amended to include developing countries such as China, India, and Brazil.).
41. Statistics from the environmental administration show that few main cities have good air quality. MINISTRY OF ENVIRONMENTAL PROTECTION, PEOPLE’S REPUBLIC OF CHINA, Atmospheric Environment (Dec. 18, 2007), http://english.mep.gov.cn/standards_reports/EnvironmetalStatistics/yearbook2006/200712/t20071218_115208.htm. In terms of oil prices, China is an oil-deficient country and must rely on the unstable and high-price international oil market.
The promulgation of the Renewable Energy Law provides the basic legal framework for development and utilization of renewable energy. However, the Renewable Energy Law is written in relatively general terms; only 33 articles prescribe basic principles and systems of development and utilization of renewable energy. This lack of specificity cannot satisfy many of the practical needs that arise during the development and utilization of renewable energy. Therefore, after the promulgation of the Renewable Energy Law, relevant authorities such as the National Development and Reform Commission issued a series of regulations and rules to ensure the implementation of the law. These rules and regulations include the Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, the Provisional Measures for the Administration of Special Funds for Renewable Energy Development, the Provisional Measures for Allocation of Additional Income for Renewable Energy Power Price, and Measures for Administration of Grid Enterprises Purchasing Full Renewable Energy Power Quantity. Furthermore, the National Development and Reform Commission, the Ministry of Finance, and the Ministry of Construction

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42. See The Renewable Energy Law, supra note 6.
43. Renewable Energy Law legal framework is drafted to set up the basic regulatory system for renewable energy, rather than to adjust the social relations directly in renewable energy field. More important, the promulgation of this law should convince investors of the unchangeable strategic development direction of renewable energy in China, which would greatly help attract long-term investment.
44. Ke Zai Sheng Neng Yuan Fa Dian Jia Ge He Fei Yong Fen Tan Guan Li Shi Xing Ban Fa (可再生能源发电价格和费用分摊管理试行办法) [The Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy] (promulgated by the Nat’l Dev. and Reform Comm’n, Jan. 4, 2006) (China), available at [link to document].
46. Ke Zai Sheng Neng Yuan Dian Jia Fu Jia Shou Ru Tiao Pei Zan Xing Ban Fa (可再生能源电价附加收入调配暂行办法) [Interim Measures About the Allocation of Renewable Electricity Additional Revenue] (promulgated by the Nat’l Dev. and Reform Comm’n, Jan. 11, 2007) (China), available at [link to document].
issued policies in the field of renewable energy.\textsuperscript{48} Such regulations and policies flesh out the legal framework of the \textit{Renewable Energy Law}.\textsuperscript{49} Systems such as “full purchase”, “classified fixed price”, “expenses distribution,” and “economical incentives” are primarily set up in those regulations and polices by means of specific and feasible measures. They played an important role in the promotion and development of special renewable energy technologies and the renewable energy industry.

It was evident that the development and utilization of renewable energy penetrated into many fields, such as environmental protection and energy. This was especially evident in China’s response to climate change during this phase. Climate change is increasingly becoming another definite and major driving force for strengthening renewable energy policies and legislation.\textsuperscript{50} China is gradually forming a large-scale system of laws and policies to deal with climate change.

\textsuperscript{48} See, e.g., \textit{Cu Jin Feng Dian Chan Ye Fa Zhan Shi Shi Yi Jian} (促进风电产业发展实施意见) \textit{Opinions on Promotion of Wind Power Enterprises Development}; \textit{Guan Yu Jia Qiang Sheng Wu Ran Liao Yi Chun Mu Jian She Guan Li, Cu Jin Chan Ye Jian Kang Fa Zhan De Yi Jian} (关于加强生物燃料乙醇项目建设管理，促进产业健康发展) [The Circular on Strengthening the Construction and Administration of Biofuel Ethyl Alcohol Projects to Promote the Industrial Healthy Development] (promulgated by the Nat’l Dev. and Reform Comm’n and the Ministry of Fin., Dec. 14, 2006) (China); \textit{Guan Yu Fa Zhan Sheng Wu Neng Yuan He Sheng Wu Hua Gong Cai Shui Fu Chi Zheng Ce De Shi Shi Yi Jian} (关于发展生物能源和生物化工财税扶持政策的实施意见) [Implementation Opinions for the Development of Bioenergy and Biochemical Supporting Policies] (promulgated by the Ministry of Fin.); \textit{Ke Zai Sheng Neng Yuan Jian Zhu Ying Yong Zhan Xiang Zi Jin Guan Li Zan Xing Ban Fa} (可再生能源建筑应用专项资金管理暂行办法) [Provisional Measures for the Administration of Applicable Special Funds for Renewable Energy Construction]; \textit{Ke Zai Sheng Neng Yuan Jian Zhu Ying Yong Shi Fan Xiang Mu Ping Shen Ban Fa} (可再生能源建筑应用示范项目评审办法) [Measures for Review of Applicable Exemplary Projects on Renewable Energy Construction] (promulgated by the Ministry of Fin.).

\textsuperscript{49} The \textit{Renewable Energy Law} stipulates many license terms which authorize certain sectors to establish rules for related social relations, instead of stipulating rights and obligations directly, and most of the specifications are promulgated with the authority of The \textit{Renewable Energy Law}. Consequently, those polices are no longer fragmented and informal but are unified in a complete legal frame work, forming a complete legal and policy system together with the \textit{Renewable Energy Law}. At this point, the renewable energy development in China has finished the transition from policy-oriented to law-oriented governance.

\textsuperscript{50} President H.E. Hu Jintao of the People’s Republic of China, Speech at U.N. Summit on Climate Change 7 (Sept. 22, 2009) (“China will powerfully develop renewable energy and nuclear energy, and endeavor to the non-petrochemical energy consumption will account for about 15% in total one-off energy consumption till 2020.”).
E. From the Eve of the Copenhagen Conference in 2009 to the End of 2011: Policies and Laws on Renewable Energy Were Gradually Perfected in China

The Copenhagen Conference at the end of 2009 received high attention from the world because the international community hoped that a new legal agreement addressing climate change could be reached. China recognized the great importance of the Copenhagen Conference and had passed the Decision on Actively Addressing Climate Change (hereinafter, “the Decision”) before the conference.51 The Decision clearly set out goals, including “actively and scientifically developing renewable energies such as hydropower, wind power, solar energy, and biomass energy.”52

On the level of law, the Standing Committee of the National People’s Congress adopted the Decision on Amendment to the Renewable Energy Law on December 26, 2009 to further accelerate the development of renewable energy and solve some outstanding problems not resolved by the implementation of the Renewable Energy Law.53 The major variations of the amended Renewable Energy Law are listed as follows:

1. In the years following promulgation of the Renewable Energy Law, the problems of development and utilization planning of renewable energy in China turned up gradually, such as unforeseeable planning problems.
goals, inconsistencies between national and regional planning, and unmatched generation and grid construction planning. Therefore, the amendment highlighted the significance of planning, improved the procedure for setting up planning, and strengthened the coherence of national and local planning.  

2. The amended Renewable Energy Law sets up the full guarantee purchase system. This system stipulates that relevant sectors set national annual purchase targets for generating electricity by renewable energy according to national planning for renewable energy development and utilization, and allocate it to each electricity grid company. It also stipulates that grid companies hasten the planning and construction of the grid and develop the smart grid.  

3. The amended law merges the special funds and income from surcharges on renewable energy power prices into the renewable energy development funds. It also stipulates clearly the access cost and other relevant costs that cannot be recovered from the selling price of electricity, and allows the power grid enterprises to apply to the renewable energy development fund for subsidies.

With regard to policies, the National Development and Reform Commission and other departments issued four recent circulars. First, the Commission released the Circular on Perfecting the Grid Power Price Policies for Wind Power Generation in July 2009. In accordance with China’s available wind energy resources and infrastructure, the country is divided into four kinds of wind resource areas, and a system of representative grid pricing is established in each area. The price of the four kinds of wind resource areas were 0.51 Yuan, 0.54 Yuan, 0.58 Yuan, and 0.67 Yuan.

55. Id. at art. 7, 8, 14.
56. Id. at art. 14.
57. Id. at art. 24.
59. Id.
and 0.61 Yuan. The more resources the area has, the lower the benchmarked price. Such a policy will put an end to unclear pricing systems for wind power, and the coexistence of many power prices. This policy will also be beneficial for wind power investors to obtain a reasonable return and develop wind power resources in an orderly manner. This specification further improves the classified fixed electricity system stipulated by the Renewable Energy Law.

Second, the Circular on Perfecting Price Policies for Agricultural and Forest Biomass Power Generation was released in July 2010. The price of power generated by projects of agricultural and forest biomass is required to carry out the policy of benchmarked grid-connected price. The investors decided by a non-bidding method to employ the benchmarked price of RMB 0.75 Yuan per kilowatt (including tax) when they set a new project generating power by agriculture and forest biomass. The on-grid price of the approved generating power project by agriculture and forest biomass (except the bidding projects), which was lower than the standard mentioned above, rose to RMB 0.75 Yuan per kilowatt. Because the on-grid price of the approved project was higher than the standard above, the investors could keep their original price. The previous on-grid price projected by agriculture and forest biomass was fixed at around RMB 0.6 Yuan, but because this was relatively low to the cost, it led to loss for those power enterprises. Undoubtedly, this Circular would improve the development of the power generating industry by agriculture and forest biomass to some extent. However, it is said RMB 0.81 Yuan per kilowatt

60. Id.
62. Id.
63. Id.
64. Id.
65. Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, supra note 45 (It is stipulated that for biomass power generation projects whose on-grid electricity price is subject to government-fixed pricing, the price department of the State Council shall decide the benchmark price for each region, and the price shall be the benchmark price of on-grid electricity generated by desulfurized coal generators in each province (autonomous region or municipality directly under the Central Government) in 2005, plus price subsidies. The subsidy is 0.25 Yuan per kilowatt hour. The benchmark price generated by desulfurized coal generators at that time in each province was around 0.35 Yuan, so the benchmark price generated by agriculture and forest biomass was around 0.6 Yuan.).
would meet the operation requirement in this industry, and RMB 0.85 Yuan to 0.9 Yuan would result in better performance. 66

Third, the Circular on Carrying out Trial Work for Low-Carbon Provinces, Areas, and Low-Carbon Cities was released on July 19, 2010.67 It required the trial low-carbon provinces and cities to accelerate the development of burgeoning strategic industries, such as new energy, by giving the new industries political support.68

Fourth, the Ministry of Finance, National Development and Reform Commission, and National Energy Bureau issued the Interim Measures for the Imposition and Use of Renewable Energy Development Funds on November 29, 2011.69 It contained two major amendments. First, the surcharge on renewable energy prices and the special funds for renewable energy by the Minister of Finance are merged into renewable energy development funds.70 Second, it makes clear that the surcharge on renewable energy prices would not only subsidize grid enterprises for the purchase of renewable energy power, but also for the extra fees for management and grid-connection.71 It provides an incentive for grid enterprises and supports the full guarantee purchase system.

The Decision on Accelerating to Foster and Develop Strategic Burgeoning Industries and the Proposal of the Central Committee of the Communist Party of China concerning the 12th Five-Year Planning for National Economy and Social Development issued by the State Council in

66. 0.75 Yuan Biao Gan Dian Jia Nan Zhu Qi Ye Niu Kui (0.75元标杆电价难助企业扭亏) [China’s New Energy Website] Benchmark Price of 0.75 Yuan is Hard to Drag Generators from Loss, available at http://www.newenergy.org.cn/html/01010/10191036517.html.
68. Id. To explain the role of this policy, we should note the difference in political systems between China and America. Because of federalism, the U.S. federal government cannot interfere with development of states. Conversely, the central government in China is powerful enough to orient the development of local governments and can decide the promotion of local government leaders; thus, the central government can draw out the “even playing field” policy to make all local governments participate in the competition, and the winner will be rewarded. As a result, the central government is inclined to obey the rule actively even without punishment.
70. Id.
71. Id.
October 2010 defined the new energy industry as one of seven strategic industries to be fostered and developed over the next five years in China.\footnote{Zhong Gong Zhong Yang Guan Yu Zhing Ding Guo Min Jing Ji He She Hui Fa Zhan Di Shi Er Ge Nian Nian Gui Hua De Jian Yi \(\text{（中共中央关于制定国民经济和社会发展第十二个五年规划的建议）} \) [Proposal of the Central Committee of the Communist Party of China Concerning the 12th Five-Year Plan for National Economy and Social Development] (promulgated by the Central Committee of the Communist Party of China, Oct. 18, 2010), available at \url{http://www.gov.cn/jrzg/2010-10/27/content_1731694_2.htm}. The indent on this FN needs to be removed but the formatting is not letting me do that.} China’s Policies and Actions for Addressing Climate Change–2010 annual report, issued by the National Development and Reform Commission in November 2010, specifies that the Chinese government views the development of low-carbon green energy as a primary means to mitigate climate change.\footnote{Guo Ying Dui Qi Hou Bian Hua De Zheng Ce Yu Xing Dong-2010 Nian Nian Du Bao Gao \(\text{（中国应对气候变化的政策与行动-2010年年度报告）} \) [China’s Policies and Actions for Addressing Climate Change–2010 annual report] (promulgated by the Nat’l Dev. & Reform Comm’n, Nov. 2010), available at \url{http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File927.pdf}.} At the end of 2011, China’s policies and legislations on renewable energy—in which the Renewable Energy Law is the supporting framework, and renewable energy policies are the main body—combined with legislations and policies in other relevant areas to constitute a more perfect system.

With the help of these legislations and policies, by the end of 2011, the installed wind capacity of China reached 62.733 gigawatts.\footnote{Global Wind Statistics 2011, GLOBAL WIND ENERGY COUNCIL (July 2, 2012) available at \url{http://www.gwec.net/index.php?id=77&L=0&tx_ttnews[backPid]=76&tx_ttnews[pointer]=2&tx_ttnews[tt_news]=339&cHash=c20eccc5592}.} The installed capacity of grid-connected renewable energy in China reached 51.59 million kilowatts, and generating capacity reached 93.355 billion kilowatt hours, which eliminated 288.5 million tons of standard coal, 802 million tons of CO2, 620 thousand tons of SO2, and 62 thousand tons of NOx.\footnote{Zhong Guo Xin Neng Yuan Fa Dian Fa Zhan Yan Jiu Bao Gao \(\text{（中国新能源发电发展研究报告）} \) China Electricity Council, Research Report on the Development of Chinese New Energy Power Generation (Mar. 15, 2012), available at \url{http://www.cec.org.cn/yaowenkuaishi/2012-03-15/81741.html}.} Of all the grid-connected renewable power capacity, wind energy reached 7.3174 billion kilowatt hours, around 78.38% of the total grid-connected power capacity; solar energy reached 914 million kilowatt hours, around 0.98% of the total; agriculture and forest biomass reached 19.121 billion kilowatt hours, around 20.48%; and geothermal power and ocean power energy reached 146 million kilowatt hours, around 0.16%.\footnote{Id.}
II. CLIMATE CHANGE AND THE CREATION OF RENEWABLE ENERGY SYSTEM

While China bears no compulsory liability for emissions reductions, the systems prescribed in the Renewable Energy Law reference the Kyoto Protocol’s Annex I countries’ renewable energy policy and legislation experiences. These include the quantity target system, the renewable energy planning system, the compulsory grid-connected system, the classified grid price system, the expenses distribution system, and the special funds system.77

A. Quantity Target System

The quantity target system on renewable energy is the legal requirement for the proportion of renewable energy in the energy production or consumption mix.78

The main contents of the Kyoto Protocol are the target and schedule for greenhouse gas emissions reductions for developed countries listed in Annex I.79 Based on the schedule and targets for emissions reductions in the Kyoto Protocol, many developed countries determined their targets and schedules for renewable energy development through domestic legislation or policies. For example, Article 4 of the Council of the European Union’s (E.U. Council’s) 1998 Decision on Renewable Energy pointed out that by 2010, the quantity of renewable energy use in the E.U. as a whole will increase by 12%.80 The Common Standpoint of the Directive on the Utilization of Renewable Energy Power Generation, issued by the E.U. Council in 2001, noted that renewable energy consumption should account for 12% of the total global energy consumption in 2010, and the E.U.’s proportion of renewable energy power consumption should reach 22.1% by 2010.81 Denmark formulated an energy action plan for “21st century energy,” requiring a 20% reduction of the whole country’s CO2 emissions,

79. See Kyoto Protocol, supra note 1.
as compared to 1998 levels by 2005, and a 50% reduction by 2030.\textsuperscript{82} The Spanish government put forward a national total volume objective that renewable energy would account for 12% of total energy consumption and 29% by 2010.\textsuperscript{83} Australia announced that by 2010, renewable energy power generation should increase to 25.5 billion kilowatt-hours, accounting for 12% of total power generation in the whole country, and the supply of renewable energy would increase 2%.\textsuperscript{84}

When drafting and formulating the \textit{Renewable Energy Law}, China used legislation and experiences of developed countries and institutions as references. When designing the “quantity target” system in the \textit{Renewable Energy Law}, the Chinese government accounted for the reality of renewable energy infrastructure in China. The law specifies the “quantity target” system. Article 4 states, “[t]he Government lists the development of utilization of renewable energy as the preferential area for energy development and promotes the construction and development of the renewable energy market by establishing total volume for the development of renewable energy and taking corresponding measures.”\textsuperscript{85} At the same time, Article 7 states:

Energy authorities of the State Council set[] middle and long-term target[s] of the total volume for the development and utilization of renewable energy at the national level, which shall be implemented and released to the public after being approved by the State Council. Energy authorities of the State Council shall, on the basis of the target of [the] target of total volume in the previous paragraph, as well as the economic development and actual situation of renewable energy resources of all provinces, autonomous regions and municipalities, cooperate with people’s governments of provinces, autonomous regions and municipalities in establishing middle and long-term target[s] and releas[ing] [them] to the public.\textsuperscript{86}

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{83} \textit{Second Preamble to INTERPRETATION OF THE LAW OF THE PEOPLE’S REPUBLIC OF CHINA ON RENEWABLE ENERGY}, supra note 33, at 20.
  \item \textsuperscript{84} \textit{Id}.
  \item \textsuperscript{85} \textit{Id}.
  \item \textsuperscript{86} See The Renewable Energy Law of the People’s Republic of China, supra note 7, at art. 4.
\end{itemize}
\end{footnotesize}
In accordance with the provisions in the *Renewable Energy Law*, China issued the *Medium-Long Term Development Planning for Renewable Energy* in August 2007, which pointed out that the medium-long term development objective was that “renewable energy consumption would account for 10% [of] the total energy consumption [by] 2010, [and] 15% [by] 2020.” The *Renewable Energy Law*, as amended in 2009, further requires:

> [T]he proportion of renewable energy power generation in the total power generation, which shall be reached during the planning period, is determined by the energy authority of the State Council, together with the national power supervisory institution, and the financial authority of the State Council in accordance with the nation-wide planning for development and utilization of renewable energy.

Notice that China must resolve any conflicts between the quota system, also known as compulsory market shares, and the quantity target system. The total quantity target system for renewable energy—the provisions that determine the proportion of renewable energy development, production, and consumption compared to total energy production and consumption—is a form of compulsory shares or quotas. Once a quantity target is determined, it may be fulfilled using economic incentives, such as a fixed price grid system or a quota system. The existing renewable energy laws and policies in China are implemented through classified fixed prices (economic incentives), rather than an index quota method like the lowest power generation used by the UK.

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89. The lowest power generation is the quota system that requires power plants to generate specified amounts of renewable energy power. For example, in England, the 2009 Renewables Obligation Order stipulates that the Secretary of State determine the total number of renewable energy obligation certificates required to be produced by designated electricity suppliers (“the total obligation”) for an obligation period. Renewables Obligation Order, 2009, S.I. 2009/785, art.11 (U.K.), available at http://www.legislation.gov.uk/uksi/2009/785/article/11/made.
B. Planning System of Renewable Energy

The term “planning system” refers to a long-term overall plan formulated to achieve tasks in the future. The renewable energy planning system is a long-term plan made by the state or government to achieve the quantity target for renewable energy development. In order to achieve the quantity target for renewable energy, the Renewable Energy Law states:

The relevant authorities of the State Council shall prepare [a] national renewable energy development and utilization plan which will promote the achievement of middle and long-term quantity target[s] of renewable energy throughout the country. Energy authorities of the people’s governments at the level of province, autonomous region[,] and municipality shall, on the basis of the middle and long-term objective[s] for the development and utilization of renewable energy, cooperate with relevant authorities of the people’s governments at their own level in preparing national renewable energy development and utilization plan[s] for their own administrative regions, which shall be reported to energy authority of the State Council and the national power supervisory institution for record and be implemented after being approved by people’s governments at their own level.

The Renewable Energy Law places particular emphasis on two things. First, the law highlights the relationship between renewable energy planning and quantity targets. For example, the Renewable Energy Planning System should achieve the medium-long term objective in the development and utilization of renewable energy. Second, the connection between local and national planning for renewable energy, i.e., the nationwide renewable energy plan, should be the template for local renewable energy plans. The national energy authority and power supervisory institution must also strengthen their supervision of local renewable energy planning records, to ensure the achievement of quantity targets for renewable energy.

91. Id. at art. 8.
92. Id.
93. Id.
94. Id. at art. 18.
C. “Full Guarantee Purchase,” “Classified Fixed Grid Price,” “Expenses Distribution,” and “Economic Incentive” Systems

The measures for dealing with climate change in developed countries impacted China with regard to both the quantity target system in the development of renewable energy, and the specific systems and measures to fulfill the quantity target system. Such measures include the full guarantee purchase or compulsory grid-connected system, the fixed grid price system, the expenses distribution system, and the economic incentive system stipulated in the Renewable Energy Law.

1. Full Guarantee Purchase

The “full guarantee purchase” system for renewable energy, also called the “compulsory grid-connected” system, refers to the statutory system which requires all renewable energy power to be purchased by grid enterprises or be connected to a grid.95 An important difference between electricity produced by renewable energy and traditional energy lies in the inherent instability of many renewable energy sources due to intermittent power production. Whether solar energy or wind energy, this inherent instability is such that grid enterprises might exclude renewable energy power from grid connections.96 Some developed countries cleared away the technical and systematic obstacles for the development of renewable energy through policies and legislation in order to achieve the renewable energy quantity target and address climate change. Germany and Spain use a “full priority purchase” system, while others adopted quotas.97 Because of

95. Id. at art. 14.
97. Gröschel Geheeb, Federal Ministry for the Env’t, Nature Conservation, and Nuclear Safety, EEG- The Renewable Energy Sources Act: The Success Story for Sustainable Policies for Germany (2007) (Ger.), available at http://www.gtai.com/uploads/media/EEG_Brochure_01.pdf (The Law on Priority Renewable Energy of Germany specifies, “the grid operators shall be liable to bring renewable energy power into the operation network, to give priority to purchase full electricity quantity provided by renewable energy.” The 1998 Power Transmission Law of Germany states, “the grid operators shall accommodate total renewable energy power in the supply power grid, and reimburse the transmission power. If the renewable energy power plant is not in the power supply area of the grid operator, the grid operator which is the nearest to this power plant shall have the liability to accommodate.”); Production of Electricity by Facilities Powered by Renewable Energy Resources or Sources (B.O.E. 1998, 312) (Spain), available at http://www.solarpaces.org/Library/Legislation/docs/RD_2818-1998_en.pdf (requiring units in the renewable energy power station be connected with the grid of a power distribution
Germany’s outstanding renewable energy performance, and China’s dire need and strong desire to develop renewable energy, China used the German “full purchase” system as a reference when developing the Renewable Energy Law.98

The “full purchase” system was established in the Renewable Energy Law of 2005. China then issued Administrative Provisions on Renewable Energy Power Generation on Jan 5, 2006, and Regulatory Measures for Grid Enterprises’ Full Purchase of Renewable Energy Electricity on July 25, 2007. These two regulations give detailed provisions on the procedure of full amount purchase, liability for power generation enterprises, liability for grid companies (mainly from the technological perspective), and duties of SERC.99 However, the effects of these regulations were not as expected. Take wind power as an example. First, the regions with abundant wind power resources usually lag behind in grid construction, and the grid construction could not follow the rapid development of wind power generation.100 Second, the current technology in grid enterprises could hardly guarantee the secure operation of grid connections to renewable energy power.101 Third, the equipment of wind power generation is so advanced that electric generation accidents occur frequently, which heavily enterprise. If it is feasible for the grid to absorb at the technological level, the additional output power shall be transmitted into grid through power distribution enterprise.


100. Quan Guo Feng Li Fa Dian Biao Gan Shang Wang Dian Jia Biao (全国风力发电标杆上网电价表) [Table of National On-grid Electricity Benchmark Price of Wind Power Generation], available at http://www.ndrc.gov.cn/zfdj/jggg/dian/W020090727546284276176.pdf (showing that regions with abundant wind power resources of I and II groups are in the middle and western parts of China such as Neimenggu Province, Xinjiang Province, and Gansu Province, where the grid construction is normally not as developed as other regions).

impaired enterprises’ intent to purchase electricity by wind generation to ensure grid security. On the whole, it is impossible for grid enterprises to purchase electricity generated by renewable energy in full amount in reality, and compulsory purchase is not feasible under the cost and effect principle. Consequently, the “full purchase” system was modified, and became the “full guarantee purchase” system in the Renewable Energy Law as amended in 2009. The amendments stipulate, “[t]he state carries out the system of full guarantee purchase of renewable energy power generation.” The Renewable Energy Law determines three “guarantee” measures. First, it requires that according to the plans of national development and utilization of renewable energy, relevant state departments determine the annual purchase target of generation capacity, allocate it to each grid enterprise, and dispatch the minimum purchase target for each grid enterprise. Second, the law requires “[p]ower grid enterprises ... the power grid construction, expand the scope of areas where electricity generated by using renewable energy resources is provided, develop and apply intelligent power grid and energy storage technologies, improve the operation and management of power grids,

102. Feng Dian An Quan Jian Guan Bao Gao (风电安全监管报告) [Report on Regulations on Wind Power Generation Safety] (promulgated by the State Electricity Regulatory Comm’n, Dec. 2, 2011) (reporting that from January to August 2011, there were 193 accidents on out-grid of electric generating set of wind power, of which there were 54 accidents losing wind power electricity around 100-500 thousand kilowatts, and 12 accidents losing wind power electricity above 500 thousand kilowatts).

103. See (国家发展改革委关于印发《可再生能源电价附加收入调配暂行办法》的通知) [Notice of the National Development and Reform Commission on issuance of the Interim Measures for Allocation of Income from Surcharges on Renewable Energy], (promulgated by State Development and Reform Commission Jan. 11, 2007, effective Jan. 11, 2007) en.pkulaw.cn, at art. 9 (China), available at http://en.pkulaw.cn/display.aspx?id=8973&lib=law&SearchKeyword=Interim Measures for Allocation of Income from Surcharges on Renewable Energy&SearchCKeyword= (explaining grid-access expenses for renewable energy power generation projects refer to transmission investments and operation and maintenance costs that are incurred for renewable energy projects to become grid-connected. Standards for grid-access expenses are established according to the line length: 1 fen/kWh within 50 kilometers; 2 fen/kWh for 50-100 kilometers; and 3 fen/kWh for over 100 kilometers); see The Renewable Energy Law of the People’s Republic of China, supra note 7, at art. 21 (explaining access cost and other relevant expenses reasonably incurred to an electricity grid enterprise due to its purchase of electricity generated by using renewable energy may be reckoned in its electricity transmission cost and be recoverable from the selling price of electricity. Therefore, these fees could be added into the fixed price and be recovered from the selling price. If access cost for grid enterprises is higher than the standard price in the above regulations, it could be subsidized by the National Development Fund on Renewable Energy. However, the great capital gap for the subsidy and long subsidy circle make it hard for enterprises to be repaid by their investment.).


105. Id.
improve the ability for absorbing electricity generated by using renewable energy resources, and provide services for bringing electricity generated by using renewable energy resources on grid”.106 Third, for the access cost and other relevant costs that cannot be recovered from the selling price of electricity, the power grid enterprises may apply to the renewable energy development fund for subsidies.107 This article is instrumental in solving the problem of recovering costs paid for grid-connection.

2. Classified Fixed Grid Price

The purpose of a “full purchase” system is to solve the grid-connection problem for power generated by renewable energy power plants. Because the development and utilization of some types of renewable energy are restricted by technology, raw materials, and resources, the development and utilization costs are higher than those of fossil energy.108 If a renewable energy power plant must trade with the grid enterprise in accordance with the price of fossil energy power generation, the renewable energy power plants are unfavorable due to high prices. As a result, all countries subsidize renewable energy power to reduce its price.109 Moreover, because of the different levels of energy technologies and endowments, costs of different types of new energy are different, and the costs of the same kind of new energy power generation projects varies in different regions. Therefore, the price should be determined according to the different types and different regions in order to reflect the true cost of power generation. For example, Germany determines grid power prices based on different classifications according to the level of technological development and available resources.110 China uses the German approach to carry out its “classified fixed grid price.” Article 19 in the Renewable Energy Law states:

[grid power price of renewable energy power generation projects shall be determined by the price authorities of the State Council in the principle of being beneficial to the development and utilization of renewable energy and being economic and reasonable according to the generation power characteristics of various kinds of renewable energy

106. Id.
107. Id. at art. 24.
109. Id.
110. See GEHEEB, supra note 97.
and specific circumstances of various areas, where timely adjustment shall be made on the basis of technological development for the development and utilization of renewable energy. The price for grid-connected power shall be publicized.\textsuperscript{111}

After promulgation of the \textit{Renewable Energy Law}, the national price authority issued a series of policies on renewable energy pricing and determined different fixed prices for different renewable energy technologies.\textsuperscript{112} The representative power prices of wind power generation are divided into four grades: 0.51, 0.54, 0.58, and 0.61 RMB/kilowatt-hour.\textsuperscript{113} Solar energy photovoltaic grid power prices are between 0.8 and 1.5 RMB/kilowatt-hour.\textsuperscript{114} Biomass grid power prices are between 0.4 and 1.0 RMB/kilowatt-hour.\textsuperscript{115}

A classified fixed grid price has several advantages. First, the fixed price sends a clear signal to the market, which can help renewable energy power generators calculate the costs and benefits. Second, the classified price determined by different technologies and regions helps guide industry

\textsuperscript{111}. \textit{Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy}, supra note 44 (These measures were issued to carry out governmental directive prices for wind power generation projects, and the price standard is determined by the price authority of the State Council through tendering price. Biomass power generation projects may apply the governmental directive price or the price determined by government; solar energy, ocean energy and geothermal energy power generation projects shall apply the prices determined by the government.).

\textsuperscript{112}. \textit{See The Renewable Energy Law of the People’s Republic of China, supra note 6, at art. 14.}

\textsuperscript{113}. \textit{Circular on Perfecting the Grid Power Price Policies for Wind Power Generation, supra note 58} (Wind resources areas are divided into four kinds in the country, and different wind resources areas apply different grid power prices.).

\textsuperscript{114}. \textit{See Jingli Shi, \textit{Introduction to Applicable Prices and Policies for Renewable Energy in China, the Pricing System and Policies Training for Renewable Energy Power}} (“The state issued no uniform pricing policy on solar energy Photovoltaic grid power. The Photovoltaic grid power prices are including: (1) the price determined by the state: the national price authority determines the price according to PV projects, one project applies one approved price. At present, the national price authority only approved the power prices for eight PV projects: in 2008 and 2009, the National Development and Reform Commission approved two projects in Shanghai, one project in Inner Mongolia, one project in Ningxia, the price is 4 RMB/kilowatt-hour; in April 2010, approved the temporary grid power price of 1.15 RMB/kilowatt-hour for four projects in Ningxia. (2) Tendering power price: in June 2009, the project of ten thousand kilowatt desert power station in Dunhuang determined the bidding developer, and the price was 1.09 RMB/kilowatt-hour. In September 2010, the power price is 0.7288-0.9907 RMB/kilowatt-hour based on the accepted bidding result for 13 projects of 280 thousand kilowatt in six provinces and regions in northwest China. (3) Local fixed power price: in Jiangsu, 2.15, 1.7 and 1.4 RMB/kilowatt-hour; in Shandong, 1.7 and 1.4 RMB/kilowatt-hour.”).

\textsuperscript{115}. \textit{See Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, supra note 44, at art. 8, 9; see also Circular on Perfecting Price Policies for Agricultural and Forest Biomass Power Generation, supra note 61.}
development and achieves the goal of macroeconomic regulation and control. Third, it is convenient and simple in practice compared to a quota system.

On the other hand, a classified fixed grid price also has some disadvantages. First, it does not have a quantity target regarding the supply of renewable energy power, thus it cannot guarantee the realization of the quantity target system. Second, because the responsibilities for developing renewable energy fall on the government and society, enterprises lack the driving force for development. In the long run, with the rapid development of China’s renewable energy industry, renewable energy production and consumption will grow explosively and governments will face great demand for subsidies which will be harder to meet. In 2010, the subsidies gap was about $2 billion, and in 2011, the gap was $10 billion. As a result, the state had to attach the power raised to 8% from 4% per kWh at the end of 2011. 116

3. Expenses Distribution

The main objective of the system of “expenses distribution” is to determine who should pay the surcharge on renewable energy power generation. The United Kingdom distributes the expenses of renewable energy development among all power suppliers, while Australia and Germany distribute the expenses among final consumers.117 Using these foreign experiences as a reference, China decided to distribute the additional expenses among final power consumers. The Renewable Energy Law prescribes:

[T]he difference between the expenses of grid enterprises to purchase renewable energy power quantity and the expenses which are calculated as per the average grid power price of traditional energy power generation, shall be reimbursed by charging the additional renewable energy power price on the basis of the selling power quantity in the whole country.118

Specifically, the scope of consumers facing the surcharge is determined by Article 13 of Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, which says:

Surcharges to the price of electricity generated from renewable energy shall be collected from electric consumers within the service range of power grid enterprises at or above the provincial level (including the bulk sale targets of the provincial power grid enterprises, consumers with self-equipped power plants, and large consumers purchasing electricity directly from power plants). Electricity consumers of county self-supplied power grids and consumers located at Tibet or engaged in agricultural production shall, for the time being, be exempted from said surcharges.\textsuperscript{119}

As to the standard of price, the surcharge system started in June 2006 at a price of 0.2 cent per kilowatt-hour. It doubled to 0.4 cent per kilowatt-hour in November 2009, and it raised to 0.8 cent per kilowatt-hour in December 2012.\textsuperscript{120} As to the usage of the surcharges, the surcharges to the price of electricity generated from renewable energy would be counted in the sales price of electricity of power grid enterprises, which would be levied as a value-added tax and income tax.\textsuperscript{121} In addition, the surcharges would be allocated and scheduled during those grid enterprises with a long cycle. Since issuance of the \textit{Interim Measures for the Administration of the Collection and Use of the Renewable Energy Development Fund} in 2011, the surcharges are no longer counted in the sales prices of electricity of power grid enterprises. Instead, it is included in the renewable energy development fund and is scheduled accordingly. In addition, the income from surcharges on renewable energy power prices subsidize a portion of the reasonable grid connection expenses and other reasonable expenses paid

\textsuperscript{119} Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, supra note 44.

\textsuperscript{120} Because industries are major electricity users, enterprises take the majority of responsibility. Surcharges have little effect on residents. Assuming a family consumes 300 kWh per month, the price is 0.48 Yuan per kWh, and the surcharge is only 2.4 Yuan.

\textsuperscript{121} Trial Measures for the Management of Prices and Allocation of Costs for Electricity Generated from Renewable Energy, supra note 44, at art. 17 ("Surcharges to the price of electricity generated from renewable energy shall be counted in the sales price of electricity of power grid enterprises, collected by power grid enterprises, accounted separately and used for designated purposes only.").
by a power grid enterprise for the purchase of electricity generated from renewable energy that is unable to be recovered from the retail power price.122

4. Economic Incentive

Another barrier that restricts the development and use of renewable energy in China is inadequate funding. This is because the absence of funds restricts renewable energy technology research and development, introduction of foreign advanced technology, construction of renewable energy infrastructure, and investments for establishing plants. For this reason, technology and funding are concerns for developing countries in the international negotiations regarding climate change. The “expenses distribution” system solves the problem of sharing additional costs of renewable energy that are higher than traditional energy power generation. That system, however, does not solve the problem of financial barriers restricting renewable energy development on fundamental matters such as technological research and development, equipment manufacture, and resource exploitation. Therefore, Chapter 6 of the Renewable Energy Law stipulates economic incentives including special funds, development foundations, preferential loans, and tax preferences.123

The Renewable Energy Law of 2005 stipulates, “[T]he state finance sets up the special funds for renewable energy development.”124 After the implementation of the Renewable Energy Law, the Ministry of Finance issued the Provisional Measures for the Administration of Special Funds for Renewable Energy Development in 2006, which states that the special funds for renewable energy development are “set up by the finance authority of the State Council by laws, for the purpose of supporting the special funds for the development and utilization of renewable energy.”125 The development of special funds is arranged by the Central Financial Agenda.126 The measures issued by the Ministry of Finance may fulfill the special funds system, and the State utilizes the special funds to support

122. See Interim Measures for the Imposition and Use of Renewable Energy Development Funds, supra note 65.
124. Id. at art. 24.
126. Id.
renewable energy projects through grants and loan interest subsidies.\textsuperscript{127} Grants are mainly used for projects with fewer profits and more public benefits; loan interest subsidies are used for projects listed in the directive catalogue on renewable energy industrial development in conformity with credit conditions.\textsuperscript{128} Moreover, “[t]he special funds shall primarily be used to support the following activities”:

1. scientific and technological research, establishment of standards, and demonstration projects for the development and utilization of renewable energy;
2. renewable energy utilization projects providing energy for daily use in rural and ranching areas;
3. the construction of renewable energy independent power systems in remote areas and islands;
4. surveys and assessments of renewable energy resources and the construction of the relevant information systems;
5. the promotion of indigenous production of equipment for the development and utilization of renewable energy.\textsuperscript{129}

However, because the special funds system is uncertain on sources of funds, quotas, and applicable scope, the amended \textit{Renewable Energy Law} set up the renewable energy development fund on the basis of integrating additional income and special funds for the development of renewable energy power generation.\textsuperscript{130}

In addition, China has a number of relevant tax discounts and subsidiary policies. As to the VAT value-added tax policy, wind power generators enforce the policy with 50\% paid back.\textsuperscript{131} As to the enterprise income tax, where a new project is approved after January 1, 2008 for hydropower, nuclear power, wind power, ocean energy power, solar energy power, or geothermal power, and the project conforms to the conditions in the \textit{Catalogue on Enterprise Income Tax Preference for Public

\textsuperscript{127} Id. at art. 17.
\textsuperscript{128} Id.
\textsuperscript{129} Id.
\textsuperscript{130} Decision on Amendment to the Renewable Energy Law, \textit{supra} note 53.
**Infrastructural Projects**, the enterprise may enjoy a preferential income tax treatment of a “three year exemption and three year reduction by half.”

**III. PROBLEMS AND THE FUTURE OF POLICIES AND LAWS ON RENEWABLE ENERGY IN CHINA**

The Renewable Energy Law and its relevant policies achieved considerable results, such as promoting the deployment of wind, hydropower, and other renewable energy generation. However, we should be aware that there are still imperfections, and it will be necessary to further modify, supplement, and perfect the Renewable Energy Law and its relevant policies.

**A. Legislative Aim**

When looking back to the history of the Renewable Energy Law’s development, it can be concluded that renewable energy developed in the context of the international community becoming increasingly concerned about addressing climate change. As a result, the Renewable Energy Law should specifically state that responding to climate change is the primary reason for developing and utilizing renewable energy. This would have two advantages. First, it would show China’s commitment to addressing climate change and that actual steps are being taken towards that goal. Second, it is advisable for Chinese law amendments to take into account the latest trends in addressing climate change, which would be favorable for the Renewable Energy Law closely connected to climate change. For example, the distributive power generation by renewable energy in Germany and Spain is a growing trend in renewable energy generation development. In spite of its economic benefits being lower than on-grid generation on a large scale, distributive power generation enjoys advantages such as simply being on a smaller scale, having fewer effects on surroundings, and not requiring extra

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fees for connection, which are of vital importance to addressing climate change. Such a trend should be taken into account in Chinese renewable energy law amendments in the future.

When the *Renewable Energy Law* was amended in 2009, the Legislature missed an opportunity to declare responding to climate change as the legislative objective.

**B. The Portfolio Standard (Quota System) for Renewable Energy Power Generation**

The portfolio standard for renewable energy power generation refers to a compulsory provision for the proportion of renewable energy power generation within the total power quantity for a given period. This is also called the “compulsory market share objective” for renewable energy power generation.\(^{134}\) There is no provision concerning the quota index of renewable energy power generation in the *Renewable Energy Law* of 2005.\(^{135}\) After the implementation of the *Renewable Energy Law*, in 2007 the *Medium and Long Term Development Plan for Renewable Energy* established a compulsory market share objective of non-hydropower renewable energy. The market share objective mandates that by 2010 and 2020, the proportion of non-hydropower renewable energy entering the total grid power quantity in areas covered by the large grid must reach over 1% and 3%, respectively. For the investor whose total equity installed capacity exceeds 5 million kilowatts, its proportion of non-hydropower renewable energy should account for over 3% and 8%, respectively.\(^{136}\) The *Renewable Energy Law*, as amended in 2009, states that:

[T]he national energy authority, together with the national power supervisory institution and financial authority of the State Council, shall determine the proportion of renewable energy power in the total power quantity during the planning period, and formulate the specific measures for grid enterprises giving priority to dispatch and purchasing full renewable energy power in accordance with the nationwide planning for development and utilization of renewable energy.\(^{137}\)

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This provision is generally interpreted as the legislative basis for carrying out the renewable energy quota system. Additionally, the Decision on Accelerating to Foster and Develop Strategic Burgeoning Industries issued by the State Council in October 2010, clearly “implement[ed] a new energy quota system.”

The provision in Article 14 of the Renewable Energy Law may provide the basis for the implementation of a renewable energy quota system, but it does not require one. The determination of “the proportion of renewable energy power in the total power quantity” also determines the total volume objective of renewable power generation. This is no different than the total volume objective system for renewable energy. In order to achieve the total volume objective or quota index for renewable energy power generation, a quota system or fixed power price system may be chosen. However, if the quota system is chosen, China must pay attention to possible conflicts with the fixed power price system.

In many countries, renewable energy power generation objectives are generally achieved by either a fixed power price or quota system. Therefore, countries must make a choice between these two systems. For example, Germany uses a classified fixed price system, while the United Kingdom and United States use quota systems. In the fixed power price system, the state grants the enterprise fixed profit return in the form of subsidies in order to enable the enterprise to voluntarily carry out the necessary actions. But a quota system is not the same, because it forces the enterprise to carry out the necessary actions based on a compulsory directive or administrative order. The enterprise may meet the quota through the market (for instance, by purchasing renewable energy) or it must create the renewable energy itself, and the costs of performing the task are borne by the enterprise without national compensation. The government is involved in both systems; the difference is that the fixed power price system is a “carrot,” but a quota system is a “stick.” That is to say, because the price is fixed under the fixed power price system, enterprises can receive a return on their investments without market competition. But under


139. Decision on Amendment to the Renewable Energy Law, supra note 53.

140. See id. (The Renewable Energy Law does not specify how the total volume objective is to be met.).

141. Id. at art. 19–23.
the quota system, enterprises are compelled to take on certain responsibilities, and if an enterprise fails to do so, the State will penalize it.  

An advantage of the quota system is that the enterprises are given the option to choose how to meet the quota. For example, the enterprise may invest and construct qualifying generation to meet the quota, or purchase qualifying generation through market transactions. The enterprise will then choose the most efficient means with the lowest costs to meet the quota requirement. Under the background of a quota system, however, the liabilities of enterprises are undoubtedly heavier. The Renewable Energy Law adopted the fixed power price system in order to develop and attract investment in renewable energy as soon as possible. Such a system has proven fruitful in practice. Drawing on real-life experiences, power generators’ enthusiasm to invest in renewable energy remains high under the fixed power price system, and therefore implementing a compulsory quota system appears to be unnecessary. If China establishes a quota system without undoing the fixed price system, conflicts are certain to arise between the two.

C. Full Guarantee Purchase Liability of Grid Enterprise and Quota System

The Renewable Energy Law of 2005 provided that grid enterprises must purchase 100% of power generated by renewable energy plants, or compensate the renewable energy generator for any economic loss derived from power not being purchased by the grid company. SERC shall order the grid companies to correct the harm within a stipulated period of time. In case of refusal to make a correction, a fine of not more than 200% of the economic loss of the renewable power generation enterprises shall be imposed.

Specifically, the Regulatory Measures for Grid Enterprises’ Full Purchase of Renewable Energy Electricity stipulates:

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142. Because China is drafting the Measures for the Administration of Renewable Energy Power Generation Quota, it is unclear how to penalize an enterprise that does not meet the quota.
145. Id. at art. 29.
146. Id.
Where a grid enterprise or electricity dispatching entity commits any of the following acts, causing economic loss to an enterprise generating renewable energy electricity, the grid enterprise shall be liable for compensation, and the electricity regulatory authorities shall order the grid enterprise to make correction within a certain time limit; and in case of refusal to make correction, the electricity regulatory authorities may impose a fine of not more than 200 percent of economic loss incurred by the enterprise generating renewable energy electricity:

6. failing to construct, or failing to construct in a timely manner, the grid-connection works in a renewable energy electricity generation project;
7. refusing or obstructing the conclusion of an electricity purchase and sales contract or a grid-connection dispatching agreement with an enterprise generating renewable energy electricity;
8. failing to provide, or failing to provide in a timely manner, grid-connection services for renewable energy electricity;
9. failing to give priority to renewable energy electricity during dispatch; or
10. otherwise causing a failure of full purchase of renewable energy electricity.

The grid enterprise shall, within 15 days from the date of the electricity regulatory authorities’ confirmation of economic loss, compensate the enterprise generating renewable energy electricity. 147

This stipulation has some big problems. In theory, if the grid enterprise refuses to sign contracts according to the full guarantee purchase system, SERC will issue an order for remedial actions and impose a fine according

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But the grid enterprise and power generators are equal civil subjects so that when the grid enterprise does not purchase the renewable electric power according to the agreement, it must bear the liability for breach. Therefore, the power generators should file the charge in court to get the compensation for the loss and the court will determine the amount of compensation according to the related stipulation of the contract law. Then the judgment will be executed by the executive authority of the court. SERC cannot stipulate under which situations the grid enterprise must pay the electricity generator as well as the compensation time and form. In practice, after promulgating the Renewable Energy Law, it has been very common for the renewable energy power generators to not be able to connect to the grid. However, SERC has not accepted this reality. In other words, if all renewable energy power generators seek redress under this provision of Article 29 of the Renewable Energy Law, SERC will not have enough manpower and funding to undertake this work. In short, this system is impractical.

Therefore, the full purchase system stipulated in the Renewable Energy Law of 2005 has fundamental problems. SERC attempted to request that grid enterprises purchase all the renewable energy power on a “case by case” basis. But the full purchase system does not have a solid foundation in theory and practice. Conversely, according to Article 14 of the Renewable Energy Law of 2009, which stipulated that China prepare to establish the renewable energy purchase quota system, if China executed this system, SERC just needs to inspect the grid enterprise regarding whether to complete the quota, but not to intervene in the contractual relationship between the grid enterprise and renewable energy power generators. As long as the responsibility of the quota system is strict enough, the grid enterprise will adopt each method necessary to meet the quota. Therefore, the quota is more practical than the full purchase system.

D. Design of Quota System

Assuming that the quota system is chosen to meet the total volume objective and guarantee full purchase of renewable energy power, it will be crucial to establish the specific type of quota system. Foreign experience in implementing quota systems has shown the need for structure and reliability. There is no federal quota system in the United States, but there are compulsory quota indexes for renewable energy in twenty-nine states.

and Washington, D.C. The policies in each state have obvious differences, but there are some common requirements such as the bases of renewable energy certificate transactions, specific provisions on the entity undertaking the quota liability, types of qualified renewable energy, transaction contracts and supervision, and penalties, so as to seek the implementation of compulsory shares through market mechanisms.

Additionally, six European Union member states carry out the quota system, including the United Kingdom and Sweden. These countries have requirements similar to the United States.

For China, initially, a tradable “green certificate” system should be established. Thereafter, the state should make specific provisions for obtaining the green certificate, defining its effective period, regulating the body that undertakes a quota liability, and trading certificates. The government should also establish a method to supervise the system and impose penalties.

The National Energy Authority is researching and drafting the Measures for the Administration of Renewable Energy Power Generation Quota, but there are disputes over basic questions, such as which bodies will be liable under the quota system, whether the quota is based on transactions or simple administrative orders, and what is the relationship between the quota system and the fixed power price system. When China sets up the quota system for renewable energy power generation, it should reference international experiences and incorporate established practices into the country’s policies. In sum, a quota system should be based on the trade of green certificates or renewable energy certificates, rather than by simple administrative order. China also needs to consider its national situation and current systems when designing the specific systems. Issues to consider include the current status of power market reform in China, the current situation and associated problems of renewable energy development.


150. Id. at 6.


152. Id. at 4.

in China, and the foundational work needed to implement a renewable energy quota system. The specific design for the quota system should include factors such as a quota index, the body undertaking the liability, qualified renewable energy power, the acquisition of renewable energy certificates, supervision of transactions, and punishment of illegal acts.

E. The Legal Mechanism of Economic Incentive, Renewable Energy Technology, and the Legal Mechanism of Addressing Climate Change

At the moment, the role of climate change in China’s renewable energy legal system is mainly macroscopic. However, along with the advancement of addressing climate change, though very slow, a set of performable legal mechanisms will finally be established. Therefore, in the long run, laws and policies on renewable energy will definitely have to consider the role of this legal mechanism at the micro level. On the one hand, Chinese renewable energy law must obey the rules of the legal mechanism (like how the present Chinese policy of subsidizing renewable energy must follow the rules of WTO). On the other hand, Chinese renewable energy law also needs to study the legal mechanism to perfect its domestic renewable energy legal system.

Nowadays, China is backward in funds and technology, which is the main point of present climate change negotiations. As a result, China must fully use the related mechanisms of funding aid and technology transfer in the legal mechanism in the future. This will help to attract funds and import techniques to speed up the development of the Chinese renewable energy industry. This will be one of the most important challenges that Chinese renewable energy law takes up in the future.

IV. CONCLUSION

China has advanced renewable energy development significantly in recent years, at least in part due to climate change. The examination of the Renewable Energy Law illustrates how China has attempted to promote renewable energy through law and supporting policies. Although China has had much success in some areas, many barriers to realizing the full potential of renewable energy remain.
AGRO-GMO BIOSAFETY LEGISLATION IN CHINA:
CURRENT SITUATION, CHALLENGES, AND SOLUTIONS

Wenxuan Yu* & Canfa Wang**

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INTRODUCTION

Despite bringing new opportunities to agriculture worldwide, genetically modified organisms (GMOs) have negatively affected plants, food safety, and ecosystems. The agricultural sector has been particularly affected by GMOs. For this reason, agricultural-GMO (agro-GMO) biosafety legislation is gaining more attention around the world, especially in developing countries with large populations and heavy agricultural dependence. China has also paid attention to GMO biosafety by enacting several key pieces of legislation and establishing an administrative body. Although China has passed regulations and rules on agro-GMO biosafety management, the country faces some challenges in this field. This paper focuses on the current situation, the challenges, and the solutions of agro-GMO biosafety management in China.

I. THE CURRENT STATE OF CHINA’S AGRO-GMO BIOSAFETY LEGISLATION

A. The Legal Framework

China’s legal framework of agro-GMO biosafety mainly consists of four types of laws, described below as the four pillars of agro-GMO biosafety protection. The first pillar is The Environmental Protection Law, which regulates the protection of specific habitats, and, to some degree, serves as the legal basis for biological safety protection. Article Seventeen of this law states that the “people's governments at various levels shall take measures to protect regions representing various types of natural ecological systems, regions with a natural distribution of rare and endangered wild animals and plants, [and] regions where major sources of water are conserved . . . .” This provision provides the legal ground for agro-GMO biosafety management at the level of basic environmental law.

The second pillar is comprised of legislation specifically addressing agro-GMO biosafety issues. China has established and implemented the following rules on agro-GMO biosafety: Regulations on Agro-GMO Biosafety Management (2001); Management Measures on Agro-GMO Biosafety Evaluation (issued 2002, revised 2004); Management Measures on GMOs Labeling (issued 2002, revised 2004); Management Measures on Safety of Agro-GMO Import (issued 2002, revised 2004); Management Procedures on Agro-GMO Biosafety Evaluation; Management Procedures on Safety of Agricultural GMOs Import, Review, and Approval Procedures on Agricultural GMOs Labeling; Management Measures on Agricultural Germplasm Resources (2003); Approval Measures on Agro-GMO Processing (2006); Implementation Rules of Regulations on the Protection of New Plant Varieties (2007); and Licensing Measures on Livestock Genetic Materials Production (2010). Of these regulations and rules, the Regulations on Agro-GMO Biosafety Management plays a leading role. All of the above laws establish basic rules pertaining to classification-based administration and evaluation, labeling, licensing for production, licensing for business operations, and examination and approval procedures. Taken together, the above laws regulate agro-GMO research, production, and processing; business operations; import and export; supervision; and examination.

The three measures and their corresponding procedures include detailed regulations pertaining to safety evaluations, imports, and labels that are intended to make the laws more enforceable. The Management Measures on Agricultural Germplasm Resources touch on the management of agro-GMO safety by providing extensive guidance on the collection, evaluation, registration, conservation, reproduction, utilization, international exchange, and information management of agricultural germplasm resources. The Approval Measures on Agro-GMO Processing outlines the requirements for agro-GMO producers, specifically application procedures and license management. The Implementation Rules of Regulations on the Protection of New Plant Varieties stipulates that the name of a new plant variety and application to register a new variety must be consistent with the relevant rules regarding trans-genetic plant varieties in the Safety Certificate of

5. Regulations on Safety of Agricultural Genetically Modified Organisms art. 6.
6. Id. art 8.
7. Id. art. 19–23.
8. Id. art. 26.
9. Id. art. 39–42.
Agro-GMOs (production and application). If the organism is genetically modified, the application must have either an Approval Certificate of Agro-GMOs, or a Safety Certificate of Agro-GMOs (production and application) attached. Licensing Measures on Livestock Genetic Material Production regulates areas such as reporting, evaluation, review and approval, and supervision and management.

The third pillar consists of regulations addressing biosafety issues in other relevant fields. China’s agro-GMO biosafety regulations consist of measures on the management of genetic engineering safety, forestry biological safety, genetically modified food safety, and the transboundary movement of biotechnological products. The Management Measures on Biological Genetic Engineering Safety (1993) regulates genetic engineering by requiring the laboratories to take risk management measures and operate safely. The Approval Measures on Developing Genetically Modified Engineering Activities (2006) governs genetic engineering pertaining to forests. The Management Measures on Genetically Modified Food Hygiene (2002) promotes the safety of genetically modified food through a labeling, reporting, and approval process that take into account nutritional quality. The Management Measures on Food Labeling (2007) mandates that genetically modified food or food containing genetically modified materials have an explanatory label on the product that is written in Chinese. The Management Measures on Inspection and Quarantine of Imported and Exported Genetically Modified Products (2004) requires the inspection of genetically modified products engaged in transboundary movement, including inspections during both imports and exports. The regulation requires that products failing inspection be quarantined. Other agro-GMO biosafety rules include: the Administrative Permission Law, the Seed Law, the Law on the Entry and Exit of Animal and Plant Quarantine, the Regulations on Agricultural Chemical Control, the Management Measures of Pathogenic Microorganism Laboratory Creatures Safety, the Regulations on the Administration of Affairs Concerning Experimental Animals, the Veterinary Medicine Management Regulations, the Regulations on Administration of Feed and Feed Additive, the Approval

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Measures on Main Crop Varieties, the License Management Measures on Crop Seed Production and Business Operation, the Implementation Measures on Regulations on Agricultural Chemical Control, the Measures on Fertilizer Registration and Management.

The fourth pillar is comprised of the technical standards for agro-GMO biosafety. From 2003 to 2006, the Ministry of Agriculture issued 26 technical standards related to agro-GMO biosafety management. These standards include technical specifications and detection standards for GMOs and products containing GMOs. Seven of these 26 standards were issued in 2003, five in 2006, and 14 in 2007. Since March 1, 2008, the Ministry of Agriculture has implemented 27 new standards. In April 2009, the Ministry of Agriculture issued three new national standards on agro-GMO biosafety. In addition, China established the General Standards of Laboratory Biosafety, which set a biosafety technical standard for laboratory activities.

B. Major Legal Institutions

There are several major legal institutions in China that govern agro-GMO biosafety issues. These institutions exist pursuant to the above laws, regulations, and standards. They are discussed in the following paragraphs.

The first major legal institution is competent authorities and coordination bodies. At the national level, the Department of Agriculture under the State Council supervises and manages agro-GMO biosafety across China. It established a special commission to evaluate agro-GMO biosafety. Local governments at the county level are responsible for supervising and managing agro-GMO biosafety within their regions. Competent administrative departments of health in the local people’s governments at or above the county level are responsible for supervising and managing genetically modified food safety. Further, the State Council


established a joint inter-ministerial committee to manage and research significant issues regarding agro-GMO biosafety.\textsuperscript{15}

The second legal institution consists of agencies responsible for risk evaluations. The state has created a classification-based administration and evaluation system for agro-GMO biosafety.\textsuperscript{16} The evaluation covers research, experiments, production, processing, and business operations that import and export agro-GMOs.\textsuperscript{17} The assessment considers the potential risks posed by agro-GMOs to human beings, animals, plants, microorganisms, and the environment.\textsuperscript{18} Two bodies have overlapping jurisdiction over the evaluation process: the Agro-GMO Biosafety Commission is in charge of the evaluation of agro-GMO biosafety, while the Ministry of Agriculture’s Office of Agricultural Genetically Modified Organisms also considers and manages agro-GMO biosafety.\textsuperscript{19}

The third legal institution requires organizations engaged in agro-GMO research and experiments must have adequate safety measures and be equipped with appropriate safety facilities. Also, organizations must establish agro-GMO biosafety teams to ensure that experiments and research are conducted safely.\textsuperscript{20} Finally, organizations and individuals that transport and store agro-GMOs must take risk control measures to ensure the safe transport and storage of agro-GMOs.\textsuperscript{21}

The fourth institution is responsible for overseeing labeling. At the national level, the Ministry of Agriculture is responsible for examining, supervising, and managing the labeling of agro-GMOs in China. However, at the county level, administrative departments of agriculture supervise and manage the labeling of agro-GMOs within their regions. The General Administration of Quality Supervision, Inspection, and Quarantine of the People’s Republic of China is responsible for inspecting, testing, and verifying the labeling process of agro-GMOs at ports.\textsuperscript{22} Organizations and individuals must label the agro-GMOs listed in the agro-GMOs directory. If businesses or individuals remove GMOs from the original packaging for

\textsuperscript{15} Id. art. 5.
\textsuperscript{16} Id. art. 7.
\textsuperscript{17} Management Measures on Agro-GMO Biosafety Evaluation, Article 2.
\textsuperscript{18} Id. art. 1.
\textsuperscript{19} Regulations on Safety of Agricultural Genetically Modified Organism Safety, art. 9.
\textsuperscript{20} Id. art. 11.
\textsuperscript{21} Id. art. 25.
sale, the products must be relabeled. For products containing multiple ingredients, the label must indicate the materials that contain GMOs. Also, if the agro-GMO regulation requires special conditions for sale, the labeling must specify those conditions. Articles 7, 8, and 10 specify labeling methods and language.

The fifth legal institution requires reports to various administrative agencies. China classifies the activities related to biosafety into four categories. Level III research poses medium risks to human health and ecosystems; Level IV research presents high risks. Those researching Level III and Level IV agro-GMOs must report to competent administrative departments of the State Council prior to research. At regular intervals, researchers must submit reports on production, processing, and safety management, and must produce trace lists for agricultural administrative departments at county-level people’s governments.

The sixth legal institution is licensing. The industry administrative departments (e.g., the Ministry of Agriculture) and environmental administrative department (i.e., the Ministry of Environmental Protection), and their corresponding departments, undertake licensing at the provincial level. The relevant types of licenses for agro-GMOs are the Certificate of Agro-GMO Biosafety, Certificate of Non-Genetically Modified Agricultural Produce, Temporary Certificate of Imported Agro-GMOs, Approval Document of Importing Agro-GMOs, Permit of Transboundary Movement of Genetically Modified Products, Inspection and Verifying Approval Document of Agro-GMOs Labeling, and Permit of Agro-GMOs Labeling.

23. Id., art. 5.
24. Id. art. 6.
25. Id. art. 7, 8 and 10.
27. Id. art. 23.
28. Id. art. 33.
29. Id. art. 37. These licenses allow consumers to make informed purchases by disclosing products that contain GMO.
32. Regulations on Admin. of Agric. Genetically Modified Organism Safety art. 35.
These documents cover a diverse scope, including research and experimentation, production and processing, business operation, import and export, and transboundary movement.

The seventh legal institution is comprised of administrative departments charged with supervising and inspecting agro-GMO biosafety. The departments are granted substantial authority. Administrative departments have the power to compel institutions, individuals, stakeholders, and authenticators to submit evidence and other materials related to agricultural GMOs. Such evidence may include: certificates or other documents related to agro-GMO biosafety, accounting files, data related to research, and other documents. Additionally, administrative departments can request related organizations and individuals to explain issues related to agro-GMO biosafety. Administrative departments may order organizations or persons that have violated safety regulations to cease illegal activities. Finally, in emergency situations, administrative departments may seal or seize agro-GMOs that have been illegally researched, produced, marketed, or handled.

The eighth legal institution is requirements related to emergency response. If accidents happen during the course of production and processing of agro-GMOs, those responsible organizations and individuals must immediately take remedial measures. In the meantime, such emergencies must be reported to the agricultural administrative departments of the county-level people’s governments in the county where the accident occurred. After following this regulation, those organizations undertaking the experiment and production of agro-GMOs shall establish risk control measures and emergency methods to prevent accidents. Organizations must also keep a good record of safety supervision for later inspection.

34. Management Measures on Agro-GMO Biosafety Evaluation, art. 15.
35. Regulations on Safety of Agricultural Genetically Modified Organisms, art. 39.
36. Id.
37. Id.
38. Id.
39. Id.
40. Id. art. 24.
41. Management Measures on Agro-GMO Biosafety Evaluation, art. 35.
II. EVALUATION OF CHINA’S LEGISLATIONS ON AGRO-GMO BIO SAFETY

China has long paid serious attention to agro-GMO biosafety management. In past decades, China has reinforced supervision and management of agro-GMO biosafety, instituted a technical support system for GMO safety, and promoted the healthy development of the agro-GMO industry. Additionally, China has taken part in international cooperation on agro-GMO biosafety, playing an increasingly important role in international affairs in this regard. Though these are great developments, the following problems remain unresolved.

A. The Legal Framework Needs to be Improved

In a civil law country, a working legal framework is critical for achieving the goal of the legislation. A functional legal framework in China is necessary to achieve effective biosafety management and supervision of agricultural GMOs. China’s legal framework is currently insufficient to properly manage and supervise agro-GMO biosafety.

On the one hand, there is not a comprehensive biosafety law. The existing regulations and rules were formulated by various departments for the purpose of industry management. For example, the Ministry of Agriculture formulated the Regulations on Agro-GMO Biosafety Management, which only apply to the field of agriculture, while the General Administration of Quality Supervision wrote the Management Measures on Inspection and Quarantine of Imported and Exported Genetically Modified Products (2004) for the inspection of genetically modified products transported across borders. These regulations and rules work relatively separately in practice, and the legal mechanisms lack coordination with a higher-level comprehensive law.

On the other hand, there is a lack of specific legislation in some key fields, such as management of forestry-GMO safety, management of genetically modified microorganism safety, management of genetically modified food, management of the genetics of poultry and livestock, and management of the genetics of wildlife. It is widely accepted that although agricultural biosafety is one of the most important elements in biosafety...
management, other aspects should be given emphasis in the whole legal framework.

**B. The Administrative System Needs to be Perfected**

The complex administrative regime, with several authorities involved in agro-GMO biosafety, leads to overlaps, ambiguities, or absences of regulation. For instance, both the Ministry of Agriculture and the General Administration of Quality Supervision, Inspection, and Quarantine regulate the labeling of genetically modified products. The Ministry of Agriculture issued the *Management Measures on GMOs Labeling*, which stipulated that the agro-GMOs directory must be implemented and the listed agro-GMOs must be labeled.\(^43\) Also, the General Administration of Quality Supervision, Inspection, and Quarantine issued the *Rules on Management of Food Labeling* which required labels on all genetically modified food or food containing specific genetically modified materials.\(^44\) This kind of difference results in conflicts in the scope of labeling and has influenced the implementation of these regulations and rules.

**C. Imperfect Management Institutions Decrease Their Effectiveness**

Legislation empowers administrative departments to examine, approve, and supervise genetic modification in agricultural activities. However, these laws do not provide effective guidelines on information disclosure or for public participation. Administrative departments cannot effectively regulate the labeling of genetically modified ingredients contained in such products as blended edible oil, tofu, soybean milk, soybean milk powder, preserved bean curd, soy sauce, cottonseed oil, and others, because there are no stipulations on these products in the existing laws, regulations, and rules.\(^45\)

As to information disclosure, administrative departments of agro-GMO biosafety are obliged to disclose information, but the legislation does not clearly articulate when, where, how, and what kind of information should

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45. WENXUAN YU (于文轩), SHENGWU ANQUAN LIFA YANJIU (生物安全立法研究) [ON BIOSAFETY LEGISLATION] 248–249 (2009).
be disclosed. With respect to public participation and agro-GMOS, both the Constitution and the Environmental Protection Law provide limited guidance. Also, only a few general principles outline the liabilities for violation of these kinds of stipulations. As a result, the public finds it difficult to use these principles to protect their own legitimate interests, especially the right to know information, to participate in decision-making, and to obtain remedies relevant to agro-GMO activities, which greatly impedes enforcement.

D. Problems with Enforcement and Compliance: Taking Remedies as an Example

While the remedies for economic loss and ecosystem and human health damages from agro-GMO activities are of great importance to consumers, farmers, producers, and society at large, neither existing legislation, nor the judicial system provide an adequate remedy. First, the numerous possible conclusions judges could reach present difficulties in adopting a methodical basis for determining appropriate damages caused by agro-GMO related activities. Second, related legislation on agro-GMO biosafety fails to equip the public with feasible approaches for seeking relief. Thus, the public can only resort to Contract Law, Law on the Protection of Consumers’ Rights and Interests, and Torts Liability Law to protect their legitimate interests. In the meantime, due to the restricted scope of accepting cases in administrative lawsuits, the involved parties of agro-GMO biosafety incidents cannot lodge an administrative lawsuit on the basis of current administrative law.

49. See Xu Kai, Zhu Yanling Go Further Nestle GM Status of their Consumers were Questioned, PEOPLE’S DAILY (Mar. 8, 2006, 8:53), http://finance.people.com.cn/GB/1039/4176491.html (noting that Yanling Zhu, a consumer in Shanghai, failed in the 2003 and 2005 litigation against Nestle on its products containing GMO ingredients, partly because of different testing results made by a Germany company and a Chinese institute).
III. RECOMMENDATIONS FOR IMPROVING CHINA’S AGRO-GMO
BIOSAFETY LEGISLATION

A. Legal Framework

A new comprehensive law on GMO safety should be developed and
installed as the overarching law within the legislative hierarchy. This new
comprehensive law should consist of the following provisions.

First, a preamble, which includes the objectives, scope, basic policies,
basic principles, basic institutions, scientific research, education and
training, governmental responsibilities, rights, obligations, and incentives.

Second, a supervision and management section outlining the
responsibilities of national and local authorities. This section should require
authorities to coordinate, consult, and manage GMOs. The coordination,
consultation, and management should include spot supervisions and
inspections, qualification of risk assessment organizations, risk level
assessments, GMO quality control, and provisions for dispute resolutions.

Third, a research section which includes a process for mitigating risk.
This process should mandate risk assessments and detail the examination
and approval process. This should incorporate stipulations on the
international cooperation in research.

Fourth, a comprehensive law should include a section on release and
commercialization of GMOs. This section should include a process for the
approval of the release and commercialization of any GMO. It should also
contain risk control measures that mandate environmental protection. Risk
control measures should include filing and labeling requirements.

Fifth, the law should contain a provision on transboundary movement
that regulates the imports, exports, and domestic transport of GMOs. The
regulation should establish a permitting process for the transboundary
movement of GMOs. Permits should be granted only after extensive
examination of the risks.

Sixth, the law should contain a provision on emergency responses. The
provision should include a general emergency response plan as well as a
specific section on unintentional transboundary movement of GMOs.

Seventh, the law should have a section on legal liabilities. It should
establish liabilities for administrative violations, illegal research and
experimentation, illegal assessment, illegal environmental release and
commercialization, labeling violations, illegal import, illegal export, illegal
transboundary movements, violations of duty of hearing, and liabilities for
other accidents. This section should also set up a forum for dispute
resolution and establish rules on burden of proof, causation, as well as malpractice.

Within the context of an overarching comprehensive law, the government should establish or improve specific legislation to fill in the gaps of the current legal framework and make it more effective. Such special and new legislation should clearly cover the management of agro-GMO safety (crop production), forestry-GMO safety and protocol, genetically modified microorganism safety, genetically modified food, the genetics of poultry and livestock, and of the genetics of wildlife. In addition, the legislation on technical activities management should touch upon the management of genetic engineering safety, risk assessment, and transboundary movement of biotechnology and its products. Further legislation would strengthen the management of biotechnology-related acts in different fields. Finally, damage compensation legislation should be issued as a special law or, at least, be included in the comprehensive law of biological safety or other similar laws. 51

B. Administration System

To resolve the problems in the administrative system, the government should set up three agencies to improve administrative management: a Coordinating Committee of National Biosafety, an Experts Committee for National Biosafety, and a Management Office of National Biosafety. The Coordinating Committee and the Experts Committee should be newly created, while the existing Biosafety Management Section under the Department of Natural Ecosystem Conservation of the Ministry of Environmental Protection can serve as the Management Office. The new comprehensive law on GMO safety can stipulate the functions of these three agencies as described in the following paragraphs.

The Coordinating Committee of National Biosafety would manage coordination of the different administrative bodies and consist of dispatched officials from a variety of departments under the State Council which has experience in the following areas: environmental protection, agriculture, foreign affairs, education, technology, finance, commerce, health, customs, quality inspection, forestry, food, medicine, industry, and intellectual property. It would also include other representatives from the Chinese Academy of Science Society as well as the Organization of Protecting

Consumer Rights and Interests. The Committee would coordinate national biosafety by deliberating on plans, guidelines, policies, regulations, and standards relating to the management of national biosafety. After deliberation, the Committee would institute significant policies of national biosafety and international negotiations.

The Experts Committee for National Biosafety would provide expertise on biosafety. This Committee would consist of experts in the following fields: environmental protection, biology, agriculture, forestry, intellectual property, medication, health, food, law, economics, trade, quality inspection, commerce, industry, and protection of consumer rights. This Committee would be responsible for advising the Coordinating Committee of National Biosafety on strategic decisions regarding the guidelines, policies, laws, and standards of management of national biosafety.

The Management Office of National Biosafety would be the administrative organization serving as the secretariat of the Coordinating Committee of National Biosafety and the Experts Committee for National Biosafety. Internally speaking, the agency would remain in charge of daily management of national biosafety, while, at the international level, it would serve as the office of liaison and information exchange for national biosafety, fulfilling The Cartagena Protocol on Biosafety.\(^\text{52}\)

\[ \text{C. Management Institutions} \]

It can be seen from the above that some problems exist in the management institutions in the fields of agro-GMO biosafety. A sound system of management institutions would emphasize coordination, reduce risk, and strengthen the enforcement of the law. It would include risk assessment, contained research, interim experiments, environmental release and commercialization, labeling, information disclosure and access, emergency response, and damage compensation.

First, risk assessment: organizations and individuals undertaking contained research of GMOs should first consult with a certified institution to conduct risk assessment of the donor, carrier, host, and biological characteristics of the studied GMOs. These institutions should further determine the risk level of studied GMOs. The risk assessment should be thorough. It should take into account the recipient organisms, the parental organisms, the vectors, the inserted genetic material and/or the characteristics of modification, and the living modified organism.

Additionally, the risk assessment should take into account information regarding the intended use of the organism and the receiving environment, as well as consider the detection and identification of the organism in the environment.53

Second, contained research management: those research institutions with staff undertaking Level I GMO research should file records with the related administrative departments of the State Council. If there is no related administrative department, then the institutions should file records with the administrative Department of Science and Technology and Environmental Protection of the State Council. Researchers on GMOs in Levels II, III, and IV should submit applications to related administrative departments of the State Council. Research should only begin after approval. If no corresponding administrative department governs them, researchers shall submit applications to the administrative Department of Scientific Technology and the Department of Environmental Protection of the State Council. Level I research poses no risk to human health and ecosystems, while Level II research presents low risks.

Third, interim experiments management: the filing process should also apply to contained Level I laboratory research. If contained laboratory research in Levels II, III, or IV turns into an interim experiment, those activities must obtain a license in order to continue operations.

Fourth, management of environmental release and commercialization: ensuring safe release and commercialization of GMOs could be accomplished through a reporting process. Institutions conducting research of GMOs should commission a certified organization to conduct a risk assessment on their research, the findings of which should be compiled in a report completed by this organization. The report should be sent to the related administrative department and the department should complete a preliminary opinion of the examination and sign the report. The report should then be sent to the Management Office of National Biosafety, which should organize experts from the Consulting Committee of National Biosafety to deliberate on the report and suggest approval. Next, the report should be submitted to the administrative Department of Environmental Protection of the State Council for examination and approval. If the GMOs meet the requirements for environmental release and commercialization, then the administrative Department of Environmental Protection of the State Council should issue a “License of Environmental Release of GMOs” or a “License of Commercialization of GMOs.”

53. *Id.* art. 5, 6, 15, and annex 3.
Fifth, the labeling requirement for GMOs sold on the market should cover GMOs and goods containing GMOs. The scope of labeling should expand from food to animal feed. The labeling requirement should mandate that GMO distributors create and affix a label to the product that informs the reader about the genetically modified ingredients. The label should contain every single GMO ingredient, including genetically modified feedstuff and additives. Thus, the labeling requirement informs the buyer and facilitates the later tracking of the product. If the label lists no ingredients, then the distributors should explicitly state that such products originate from GMOs. The threshold of when to label should be very explicit and should be based on the quantity of GMOs in the product. Also, any products that contain less than the threshold quantity of genetically modified ingredients should be exempted from labeling requirements. As to those products with more GMOs than the threshold, labeling should be mandatory. Neither imported goods nor goods intended for export should be exempt from the labeling requirements. With regards to imports, the exporter should be required to provide detailed lists of products, including the common, scientific, and commercial names of living modified organisms (LMOs) and the code of modified acts of LMOs. The list should also include the taxonomic names, added genovariation, modified characteristics or genes, and other information on the receiver and donor. When necessary, exporters should provide special labeling documents and other documents regarding safe disposal, storage, transport, and use of LMOs.54

Sixth, information disclosure and access: producers and distributors of agro-GMO products should be obliged to disclose certain information, especially for potential risks posed by products to the ecosystem and human health. In order to ensure public access to information on GMO products, the public should have a right to know about GMOs. Rights to know includes the right to understand, collect, and use correct information. In order to ensure public access to information on GMO products, the administrative authorities should outline how the public can exercise its right to know. Administrative authorities should clarify the scope of the public’s right to know, how to enforce those rights, and procedures for redress when those rights are violated. Disclosed information should include names and ingredients of GMOs and their products, names of

54. CANFA WANG, DAYUAN XUE, WENXUAN YU: RESEARCH REPORT ON GMO BIOSAFETY LAW (DRAFT), 107–111 (Institute of Environmental and resources Law, China University of Political Science and Law, and Nanjing Institute of Environmental Science, Ministry of Environmental Protection 2007).
producers and distributors, physicochemical or biological characteristics, potential risks to ecosystem and human health, measures for inspection, and methods of waste disposal.

Seventh, emergency response: this should include response plans for accidents. The response plan should ensure adequate human, financial, and material resources for disaster amelioration. It should also organize disaster response duties and responsibilities. When an accident occurs, the party responsible should take emergency responses, inform possibly affected stakeholders, and report the emergency to the administrative Department of Environmental Protection or other related departments above the county level where the event occurred. The responsible party should neither obstruct the investigation nor offer any objection to the penalties. The departments should report any emergency to the people’s government at the same level or related administrative department at the next level. The purpose of this is to inform the public, initiate the proper emergency responses, begin the investigation, and monitor the area.

Eighth, damage compensation: the party responsible for biosafety accidents should be strictly liable for the serious effects on human health, the ecosystem, and the economy. Environmental damage caused by humans is unavoidable despite the implementation of prompt and reasonable safety and mitigation measures. When those measures fail and human health or the health of the environment is compromised, compensation should come from those institutions and individuals engaged in contained research, interim experiments, environmental release and commercialization, transportation, storage, transboundary movement, and waste treatment and disposal of GMOs.

D. Enforcement and Compliance

First, China needs greater capacity to mitigate the risks posed by GMOs. This calls for better policies and legislation for the technology used for inspection and quarantine, as well as better risk assessment and tougher quarantine standards. Imported GMOs need to be better inspected, subjected to higher quarantine standards, and the imported GMOs that pass inspecting need to be better tracked. Additional legislation is needed to protect farmers’ interests, promote agricultural and rural economic development, and ensure the healthy and orderly development of the national biotechnological industry.

Second, enforcement would be strengthened by better policies on the technical support system that could aid safety assessment and law enforcement. The policies and legislation should bolster the technical
support system through increased financial investment and better hardware. Additionally, the policies and legislation should improve biological resource and informational databases, as well as improve the scientific management system and other operational mechanisms. The administrative authorities should also fund more scientific research and improve the capacity of researchers.

Third, enforcement should be strengthened through better policies and legislation that promote cooperation with relevant countries and international authorities. China should actively participate in negotiations to establish international technological standards of agro-GMO biosafety. In these international negotiations, the administrative authorities should safeguard the national interest of protecting ecological and human health. Ideally, authorities should develop appropriate negotiating policies and adopt a pragmatic and flexible attitude. They must pay attention to bilateral and regional negotiations and attach great importance to the active role of environmental non-governmental organizations (NGOs) in the negotiations.

Policies and regulations to enhance the public’s understanding of agro-GMO safety concerns would promote compliance. This should be accomplished through education and training, focusing especially on ecological and food safety. Different forms of training should be provided according to the varying needs of different communities or professions. In the meantime, policies and regulations should focus on raising public awareness of agro-GMO safety. They should also use mass media to publicize any information about safety concerns regarding genetically modified agricultural products. Promoting public understanding of GMO safety could further strengthen compliance. Public understanding could be increased if administrative authorities establish appropriate channels of public participation and guide the media to pay attention to the safety of GMOs. To do this, authorities should work to improve the media’s knowledge of biosafety so it can scientifically and objectively report the information. The administrative authorities should also guide environmental NGOs in carrying out projects and activities of agro-GMO biosafety. The administrative authorities should learn from the successful experiences of other countries. Further policies and regulations should also put more emphasis on protecting the public’s right to know information concerning

biosafety and establish a mechanism for sound information disclosure and access to information.57

CONCLUSION

China’s legal framework of agro-GMO biosafety management mainly consists of four types of laws: the Environmental Protection Law, the legislation specifically addressing agro-GMO biosafety issues, the regulations specifically addressing agro-GMO biosafety issues in other relevant fields, and the technical standards for agro-GMO biosafety. The major legal institutions governing agro-GMO biosafety issues mainly address the arrangement of competent authorities and coordination bodies, risk evaluations, safety measures, labeling, reporting procedures, licensing, supervision and inspection, and emergency response. Although the current legal system and institutions play an active and significant role in agro-GMO biosafety management, problems in the legal framework, administrative system, management institutions, and enforcement and compliance are holding up the effectiveness of the legislation.

The proposed solutions are fourfold. First, formulate a new comprehensive legislation law on GMO safety, stipulating the arrangement of supervision, research management measures, release, commercialization, transboundary movement of GMOs, emergency responses, and legal liabilities. In the meantime, the government should establish or improve some specific legislation to make it more effective and fill in the gaps of the current legal framework. Second, improve the administrative system by setting up three agencies: a Coordinating Committee of National Biosafety, an Experts Committee for National Biosafety, and a Management Office of National Biosafety. Third, perfect such management institutions as vehicles for risk assessment, contained research management, management of environmental release and commercialization, information disclosure and access, emergency response, and damage compensation. Fourth, strengthen enforcement and compliance by improving the capacity to mitigate the risks posed by GMOs, formulating better policies on the technical support system, and promoting the public’s understanding of agro-GMO safety concerns.

57. CANFA WANG ET AL., supra note 54, at 122–24.