

# The New York Environmental Lawyer

A publication of the Environmental Law Section  
of the New York State Bar Association

## Message from the Chair

I am excited to take on the role of Chair of the Section. It seems like only yesterday I was elected a Section officer (and my 9-year-old was in nursery school)!

The Section has a full agenda for this year, and with your help we can achieve the goals I am setting. I know I will get plenty of support from our able Section Cabinet, including Barry Kogut from Bond, Schoeneck & King PLLC in Syracuse (First Vice-Chair), Phil Dixon from Whiteman Osterman & Hanna in Albany (Second Vice-Chair), Carl Howard from EPA in New York (Treasurer), Kevin Reilly from the Appellate Division - First Department in New York (Secretary), and John Greenthal from Nixon Peabody in Albany (Section Delegate to House of Delegates). Also, I have asked for-



Alan J. Knauf

mer Section Chair Neal Madden from Harter Secrest & Emery in Rochester to serve as the Section Council representative from the Cabinet. Here are some of my plans:

### Following Up on New Initiatives

Our past Chair, Joan Leary Matthews from DEC, launched a number of great new initiatives. These include the Classroom Project, which gives us materials (available on our Web site at [www.nysba.org/environmental](http://www.nysba.org/environmental)) organized by grade for environmental lawyers to use to go into our local schools and give students, who nowadays are so interested in environmental issues, the benefits of our first-hand experiences. Another great new project is *Envirosphere*, our Section blog, run by Cullen Howe from Arnold & Porter, which is also available as a link from our Web site. Cullen has posted a lot of timely information, and we want to see your comments on these topics on the blog. And as you can see from this issue of the *Section Journal*, former Section Chair Miriam Villani is leading the charge as Editor-in-Chief of the newly revamped *New*

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*York Environmental Lawyer.* We need to keep the momentum going on these efforts.

## Greening New York

At our last Annual Meeting, the theme was "Greening New York in Response to Climate Change." We had a great program, led by our Global Climate Change Committee, which highlighted the efforts of state and local governments and the private sector to address climate change issues and be more environmentally responsible. Plus a blue-ribbon panel, the Task Force on Global Warming, issued a Report on Global Warming that was later approved by the House of Delegates. We need to act to implement some of the recommendations contained in that report, so that the Bar "walks the walk." Already, the Global Climate Change Committee is working hard on efforts to encourage local governments to "go green."

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*"For those of you who have never been to Canandaigua, which the Iroquois called the 'Chosen Spot,' it is a beautiful location on the north end of the Finger Lake that bears the same name."*

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## Fall Meeting in Canandaigua

Our Fall Meeting will be a joint meeting with the Municipal Law Section in Canandaigua at the Inn on the Lake on October 23-25. Our Section's Program Chair will be the Co-chair of the Land Use Committee, Ed Premo from Harter Secrest in Rochester. Building on our Annual Meeting, the main topic on Saturday will be "Green Development and Alternative Energy." We will cover issues like promoting, financing and regulating these projects, and also include an update on Global Warming. The "Track B" program designed for newly admitted attorneys (but open to everyone) will cover adoption, amendment and SEQRA review of comprehensive plans and zoning laws, as well as a panel on Historic Preservation 101. As an added bonus, Yvonne Marciano and Dominic Cordisco from our Mining and Oil & Gas Exploration Committee will be doing a program on Friday afternoon on permitting and environmental impacts from Marcellus Shale natural gas production.

We are planning some fun social events as part of the weekend. On Friday night, dinner will be the "Petite Culinary Demonstration" at the New York Wine and Culinary Center, which is next to the hotel. You will be able to either watch the dinner being made in the Theater, and then enjoy it along with some great New York State wines, or actually cook your own meal in the demonstration kitchen.

On Saturday afternoon, among other events there will be a wine-tasting tour in the Finger Lakes. And we figure to have a great time at a reception and dinner with the Municipal Law Section at the hotel on Saturday night.

For those of you who have never been to Canandaigua, which the Iroquois called the "Chosen Spot," it is a beautiful location on the north end of the Finger Lake that bears the same name. If you are coming from downstate, you can either take a beautiful drive up through the Finger Lakes, or fly Jet Blue, US Airways, Delta or Continental roundtrip into the Rochester airport, 35 miles away.

## Better Communications and Technology

I want to continue our efforts to upgrade our electronic communications. We need to continue to improve and add new features on our Web page. Our recent foray into the world of Webinars has been a great success. Kudos to the Co-chairs of our Task Force on Legal Ethics, Randy Young from DEC Region 6 in Watertown, and Yvonne Marciano from the West Firm in Albany, on our initial Webinar held on April 29, on the *New Ethics Rules for the Environmental Lawyer*. And then we have to salute Howard Tollin from Aon Risk Services Northeast, Inc. in Jericho, and Andrew Otis from Curtis Mallet-Prevost in New York and other members of our International Environmental Law Committee, who put on a spectacular Webinar on June 3 from both sides of the Atlantic on *Complying With Environmental Laws in Europe*. We will continue to hold Webinars, since they are a relatively easy and inexpensive way to put on timely programs. Plus we will continue to utilize other forms of new technology to do programs and communicate.

## Revitalizing Committees

Our Section has a host of committees with able chairs and members. While some have been very active, others are dormant. I want to spark some of these committees back into action. Committees can contribute in a variety of ways, like putting on Webinars, contributing an article to our *Journal*, posting on our blog, or doing a listserve. Every committee should try to hold periodic phone conferences, where you can discuss new legal developments or plan activities. Recently the Petroleum Spills Committee started holding periodic phone conferences and is looking at doing a symposium on the Oil Spill Fund. I am also hoping to organize a program on insurance and toxic tort claims in cooperation with the Section on Torts, Insurance and Compensation Law, with the assistance of the Environmental Insurance and Toxic Torts Committee. We are also looking for a theme and chairs for the 2010 Annual Meeting on January 29, which will be held at the Hilton New York.

## Dialogue with Regulators and Legislators

I want to open up our communications with regulators and state legislators. They can benefit from the practical experience that members of the Bar offer, especially in light of the wide diversity of our membership. I also hope my experience representing environmental and citizen groups, as well as brownfield developers and municipalities, will give me a balanced perspective in these efforts. While I recognize we have a procedure for taking formal actions, we also can offer informal input. Better communications will be to everyone's advantage—and contribute to a better environment.

Already, Phil Dixon, John Greenthal and I met with DEC General Counsel Alison Crocker, who, of course, is

on our Executive Committee, and other lawyers in the DEC Office of General Counsel. Alison was very receptive to the idea of an ongoing dialogue, and we have agreed to hold regular meetings or conference calls where we will pass information and concerns back and forth. If you or your committee have any particular issues you want to address with DEC, please let me know. I will try to open up similar dialogues in other venues.

Thank you all for helping me in these efforts, and I hope to see you in Canandaigua in October.

Alan J. Knauf

## A Pro Bono Opportunities Guide For Lawyers in New York State Online!



Looking to volunteer? This easy-to-use guide will help you find the right opportunity. You can search by county, by subject area, and by population served. A collaborative project of the New York City Bar Justice Center, the New York State Bar Association and Volunteer Legal Services.

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You can find the Opportunities Guide on the Pro Bono Net Web site at [www.probono.net](http://www.probono.net), through the New York State Bar Association Web site at [www.nysba.org/probono](http://www.nysba.org/probono), through the New York City Bar Justice Center's Web site at [www.nycbar.org](http://www.nycbar.org), and through the Volunteers of Legal Service Web site at [www.volsprobono.org](http://www.volsprobono.org).



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# From the Editor-in-Chief

Welcome to the inaugural issue of the Section's newly designed *Journal*. First, with many thanks to Kevin Reilly for his tremendous contribution over many years as this *Journal's* sole editor, I would like to introduce you to the new editorial team. Kevin's election as Section Secretary provided us with an opportunity to make some changes. Our new team is made up of four issue editors and me, the Editor-in-Chief. As part of the restructuring of the *Journal*, we will have a different editor for each of our four issues. Justin Birzon is our editor for this first issue. Justin is currently in private practice in New York City. Our other issue editors are Professor Keith Hirokawa, who has recently relocated to New York from Texas and is a professor at Albany Law School, and Gregory Hoffnagle, who is a graduate of Pace Law School's environmental program and practices environmental law at Mound Cotton Wollan & Greengrass in New York City. We are looking for a fourth issue editor. If you are interested, please give me a call.

In addition to adding issue editors to our team, some of the other highlights of the new *Journal* structure include themed issues. Two of the four issues each year will build on the theme selected for the Section's Fall and Annual Meetings. The editorial team will select themes for



**Miriam E. Villani**

the other two issues. This issue reflects the theme of our next Fall Meeting, which will be held in the Finger Lakes Region of New York in October: green development and alternative energy. If you have an article you would like published, please contact one of the issue editors, or me.

Each of the four issues will feature messages from our Chair and from the Issue Editor, news about our members, and profiles of long-time and new members. In addition to the substantive articles covering our issue theme, you will also find columns covering ethics issues, EPA and DEC updates, as well as recent administrative and judicial case updates.

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*"The New York Environmental Lawyer is the place to go to be in the know."*

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We will also be adopting some pollution-prevention measures. For example, our *Journal* will be delivered electronically unless you opt out and choose the old-fashioned paper edition. Stay tuned for more about this.

This is an exciting time to be a New York environmental lawyer. New environmental initiatives are being developed, policies are changing and new laws are being passed. *The New York Environmental Lawyer* is the place to go to be in the know.

**Miriam E. Villani**

## Request for Articles



If you have written an article you would like considered for publication, or have an idea for one, please contact one of *The New York Environmental Lawyer* Editors:

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Articles should be submitted in electronic document format (pdfs are not acceptable), along with biographical information.

**[www.nysba.org/EnvironmentalLawyer](http://www.nysba.org/EnvironmentalLawyer)**

## From the Issue Editor

It has been 39 short years since Congress declared “that it is the continuing policy of the Federal Government . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans” with the passage of the National Environmental Policy Act (NEPA). Many enforcement provisions quickly followed, regulating our relationship with the resources and inhabitants of the planet. Earth Day was created, and the ban on DDT was attributed to the comeback of the Bald Eagle in the contiguous United States. The transition to the 1980s was foreshadowed by toxic chemicals permeating the community of Love Canal, New York.

The 1980s were a showcase of environmental contradictions. An era aimed at remediating contaminated land through Superfund legislation is now remembered for some of our worst environmental disasters. We saw the Chernobyl meltdown, the Exxon Valdez spill, and an Executive backlash against environmental “extremism.” Tragedy struck in 1985 when the Greenpeace ship *Rainbow Warrior* was sunk off New Zealand because of its obstruction of nuclear testing. It seemed, at least for a short time, that we were rolling backward.

However, the power of the individual was televised in 1997, when we saw the face of Julia “Butterfly” Hill, a woman who spent two years in a California Coast Redwood Tree inspiring a movement that resulted in conservation of an endangered area. Our view of the world became increasingly global as the United Nations was developing the Kyoto Protocol. Outside politics, the term



Justin Birzon

“ecological footprint” was created to explain the measure of human demand on the Earth’s ecosystems. In 2006, Al Gore wrote and produced *An Inconvenient Truth*, the documentary for which he was awarded the Nobel Prize. These events helped to shape the environmental picture of today, but are nothing compared to what is to come.

We are in the midst of the most consolidated environmental movement to date. A social majority is committed to environmental responsibility. Our federal government recently tightened auto fuel economy standards, and we have an executive branch that objectively considers the science behind global change. Our challenges are escalating, but so are our opportunities. I know we are all eager to do our part in securing a habitable planet for generations to come.

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*“A social majority is committed to environmental responsibility. . . . Our challenges are escalating, but so are our opportunities. I know we are all eager to do our part in securing a habitable planet for generations to come.”*

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This issue of the *New York Environmental Lawyer* explores performance liability in green construction, an argument for solar paneling on New York schools, and how to safeguard your intellectual property during the clean-tech revolution. I would like to acknowledge the authors who contributed to this issue and extend to them a sincere thank-you. On a personal note, I would like to thank Joan Matthews for giving me the opportunity to become involved in the Environmental Law Section.

Justin Birzon

**Catch Us on the Web at**  
**WWW.NYSBA.ORG/ENVIRONMENTAL**



# In Memoriam: Bill Fahey

## A Friend Remembered

Bill Fahey was a fine lawyer and fine companion whose life was cut short far too soon. Bill was present at the Environmental Law Section's creation, as a young lawyer then working for Art Savage, who helped found the Section. His humor, enthusiasm and good judgment made him a leader early on, and he rose to Chair of the Section in 1986.

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*"Bill Fahey was a fine lawyer and fine companion. . . . His humor, enthusiasm and good judgment made him a leader early on . . ."*

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Bill's joys were two: transportation in all its forms, and his gifted and talented daughter, Julia. He delighted in his thorough knowledge of trains and buses, which led to his able legal representation of numerous transit-bus and school-bus companies for many years. He knew which cities had the best modern light-rail systems and the most extensive dedicated bus lanes. As Co-chair (with myself) of the Section's Transportation Committee, and as Chair of the New York City Bar Association's Transportation Law Committee, he organized scores of panel discussions and guest speaking engagements, dragooning rail, bus, mass transit and highway officials, attorneys and executives to enlighten lawyers about transportation issues and projects.

Bill was proud of his Air Force career, in which he served as a captain on flights in Vietnam, and of his own working-class background, about which he enjoyed reminiscing. He admired all of New York State, reflecting often about his years at Cornell Law School and practicing in Owego in the Southern Tier.

No doubt Bill's keenest joy was Julia, of whose accomplishments he boasted frequently. He took particular pride in her great interest in her Chinese heritage, which includes study of the history and language, as well as her competitive swimming and her exemplary artistic talents.

Bill Fahey's wisdom, self-deprecating wit and invariable optimism will not soon be forgotten.

—Phil Weinberg

## Remembering Bill

It is unfortunate when a friend and colleague passes away, but it is most unfortunate when such person passes away well before his time. Today, we celebrate the life of Bill Fahey. Bill was a true environmental lawyer. Art Savage, the first chair of the Environmental Law Section of the New York State Bar Association, was Bill's mentor. Bill was very active in the Environmental Law Section, first as Chair of the Transportation Committee, and thereafter as Chair of the entire Environmental Law Section. He also taught environmental law courses at Pace Law School as an Adjunct Professor.

Bill's real professional loves in life were trains and buses. He talked about them. He rode them. He planned the future for them and he defended them. Bill never had a bad word to say about anyone and never liked to argue with anyone. The closest thing to an argument I got into with Bill related to when the so called "articulated buses" first appeared in the New York Metropolitan area. When I told Bill how unsightly they were, how they would never be filled with passengers, how they would consume twice as much fuel as smaller buses, Bill really got his dander up. From that day on, I learned never to argue transportation issues with Bill again.

I also remember the year that the Environmental Law Section had its Fall Meeting in Corning. Bill insisted that we all take a bus ride to Hornell, New York, a place that most of us had never heard of, let alone visited. When we got there, Bill showed us this amazing factory where trains, trams and subways were actually being manufactured in New York State. We found this to be a real eye-opener since most of us thought that these modes of transportation were only fabricated in the Far East.

Bill Fahey loved practicing law, whether it was in a small firm, a large firm or whether it was teaching law students. The qualities that I especially remember about Bill were his keen intelligence, his extreme enthusiasm, his wonderful sense of humor, and his positive outlook on life.

Bill will be sorely missed by us. We extend our deepest sympathies to Bill's family and friends on this sad occasion.

—Joel Sachs



# 2009 Legislative Forum

The Environmental Law Section hosted its annual Legislative Forum in the Great Hall of the Bar Center on May 6, 2009. It was a resounding success. Top policy experts met in Albany to discuss environmental legislative initiatives being addressed by the State Legislature this year. Our distinguished speakers included: the Hon. Antoine Thompson, Chair of the New York State Senate's Environmental Conservation Committee; Assemblyman Robert K. Sweeney's Counsel, Stephen Liss; David Gahl, Policy Director for Environmental Advocates of New York; Kenneth J. Pokalsky, Senior Director of Government Affairs



**Joan Leary Matthews, Immediate Past Chair, NYSBA Environmental Law Section**

for the Business Council of New York State, Inc.; and Anne Reynolds, Director of the Commissioner's Policy Office of the New York State Department of Environmental Conservation.

In addition, Pete Grannis, NYSDEC Commissioner, made a brief presentation concerning citizens' suits.

Our luncheon speaker was Kim Harriman, Assistant Counsel, New York State Department of Public Service. Ms Harriman informed us about the Energy Provisions in the 2009 American Recovery and Reinvestment Act.



**Pete Grannis, Commissioner, NYS Department of Environmental Conservation**



**Kimberly Harriman, Assistant Counsel, NYS Department of Public Service**

## NEW YORK STATE BAR ASSOCIATION

**Annual Meeting  
location has been  
*moved—***

**Hilton New York**  
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**January 25-30, 2010**



# EPA Update

By Marla E. Wieder and Chris Saporita<sup>1</sup>

## I. In National News

### A. Overview

In January 2009, Lisa P. Jackson returned to EPA as its 12th Administrator. Administrator Jackson began her professional career at EPA, initially at headquarters in Washington, and later at its regional office in New York City, managing hazardous waste cleanups and helping to direct the Region's enforcement division. Administrator Jackson rose through the regional ranks before leaving EPA in 2002 after 16 years of service for the New Jersey Department of Environmental Protection (DEP). At the DEP, she served as Assistant Commissioner for Compliance and Enforcement, then Assistant Commissioner for Land Use Management, before becoming Commissioner. Prior to returning to EPA, she most recently served as Chief of Staff to New Jersey Governor Jon S. Corzine.<sup>2</sup> While DEP Commissioner, she pursued ways to reduce greenhouse gas emissions and to aggressively address pollution. She strives to have an open and honest dialogue with stakeholders and to include the under-represented in the public policy process.<sup>3</sup>

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*"EPA needs to exercise its discretion in good faith and in keeping with the directives of Congress and the courts."*

—Lisa P. Jackson, EPA Administrator

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President Obama stated that three values should serve as the foundation for EPA's work—scientific integrity, adherence to the rule of law and transparency. The Administrator has reiterated that "science must be the backbone for EPA programs" and that the agency will "rely on the expert judgment of the Agency's career scientists and independent advisors."<sup>4</sup> Policy decisions should never be masked as scientific findings. Administrator Jackson has also stressed that EPA must follow the rule of law and respect Congressional mandates and judicial decisions. While EPA has some discretion in implementation of the mandates and law, "EPA needs to exercise its discretion in good faith and in keeping with the directives of Congress and the courts."<sup>5</sup> Harkening back to the days of EPA Administrator Ruckelshaus when he promised that EPA would operate "in a fishbowl," a new emphasis has been placed on the transparency of EPA's operations.<sup>6</sup> In March 2009, Administrator Jackson provided specific guidelines about how EPA will ensure transparency in its interactions with all members of the public in an effort to restore public trust and improve to the agency's decision-making process.<sup>7</sup>

Additionally, Administrator Jackson has emphasized that as an agency EPA must strive to better connect with those who have been historically underrepresented in EPA decision-making, including the "disenfranchised in our cities and rural areas, communities of color, native Americans, people disproportionately impacted by pollution, and small businesses, cities and towns working to meet their environmental responsibilities."<sup>8</sup>

### B. Selected Initiatives

With regard to the substantive environmental issues, Administrator Jackson has stated that her top priorities include reducing greenhouse gas emissions, improving air quality, managing chemical risks, cleaning up hazardous waste sites, and protecting America's water.<sup>9</sup> While this is an ambitious agenda, the influx of Federal stimulus funds through the American Recovery and Reinvestment Act of 2009 ("Recovery Act"), as well as the largest agency-wide funding increase in EPA history, has provided the agency with an unprecedented opportunity to create "green jobs" while protecting human health and the environment.<sup>10</sup>

#### 1. Investing in a Green Recovery

The Recovery Act entrusted EPA with allocating over \$7 billion for projects and programs within the agency's purview, in order to spur technological advances in science and health and to invest in "green infrastructure" and environmental protection that will provide long-term economic benefits.<sup>11</sup> EPA is also tasked with assisting other agencies with "greening" their projects through incorporating basic sustainability and pollution-prevention principles into their investments.<sup>12</sup>

Some of the EPA funding highlights include:

- \$4 billion for loans to help communities upgrade wastewater treatment systems through EPA's Clean Water State Revolving Fund.
- \$2 billion for loans for drinking water infrastructure through EPA's Drinking Water State Revolving Fund.
- \$100 million for competitive grants for evaluation and cleanup of brownfields.
- \$300 million for grants and loans to state and local governments for projects that reduce diesel emissions, benefiting public health and reducing global warming.
- \$600 million for the cleanup of hazardous and toxic Superfund sites.



- \$200 million for enforcement and cleanup of petroleum leaks from underground storage tanks.<sup>13</sup>

In March 2009, EPA announced the designation of the first funds<sup>14</sup> and from there began to select projects across the country designed to create green jobs and boost local economies while protecting public health and the environment. For further information about the nationwide distribution of funds under the Recovery Act, see <http://www.epa.gov/recovery/index.html>. The influx of federal stimulus money has already allowed EPA to accelerate the pace of cleanup at ten of the Region's Superfund sites, and begin the assessment and cleanup at several former industrial and commercial sites in New Jersey under the brownfields program. Information on grants for clean-diesel projects, funding for addressing leaking underground storage tanks, community funding for water quality and wastewater and drinking water infrastructure projects and additional information on the environmental projects administered by EPA in Region 2 under the Recovery Act is available at <http://www.epa.gov/region02/eparecovery/>.

## 2. Increasing Agency Resources

In February, President Obama announced a proposed EPA budget of \$10.5 billion—the largest proposed funding in EPA's 39-year history<sup>15</sup> and the largest relative increase proposed for any federal agency. While much of the new funding will be directed toward clean-water programs, the budget proposal would also restore the Superfund tax, a tax on oil and chemical producers in order to replenish the fund utilized for hazardous-waste cleanup efforts. The Superfund tax, which expired in 1995, would be reinstated sometime after 2011 and will provide a much-needed boost to the persistently underfinanced Superfund program.<sup>16</sup> While as of the drafting of this article in June, the budget has not been finalized, “the president's budget makes clear that we are no longer faced with the false choice of a strong economy or a clean environment.”<sup>17</sup>

## 3. Addressing Climate Change

On April 17, 2009, in response to the Supreme Court's ruling in *Massachusetts v. EPA*, 549 U.S. 497 (2007), the EPA issued two proposed findings on greenhouse gases pursuant to section 202(a) of the Clean Air Act. The first proposed finding—the *endangerment finding*—is that the current and projected concentrations of the mix of six key greenhouse gases—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)—in the atmosphere threaten the public health and welfare of current and future generations. The second proposed finding—the *cause or contribute finding*—is that the combined emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and HFCs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change.

The proposed findings do not recommend any particular regulations and both President Obama and Administrator Jackson have said that they prefer comprehensive legislation to address greenhouse gases in the context of building a clean energy economy. At the time of this writing, Congress is considering just such legislation, comprising of a combination of emissions reductions, a cap-and-trade program, energy conservation and investment in low-carbon energy technology.

For more information, see <http://epa.gov/climatechange/index.html> and <http://www.epa.gov/climatechange/endangerment.html>.

## 4. Restoring the Clean Water Act

In response to the Supreme Court's ruling in *Rapanos v. United States*,<sup>18</sup> and reports by EPA that the ruling had clouded and narrowed Clean Water Act jurisdiction over wetlands and small tributaries, leaving potentially millions of acres of crucial wetlands and thousands of miles of streams vulnerable, Congress is debating an amendment to the Act that would clarify the expansive scope of the definition of “waters of the United States.”

The Senate Environment and Public Works Committee is considering legislation sponsored by Senator Russell Feingold, the Clean Water Restoration Act (S.787), which would restore broad jurisdiction under the Act by removing “navigable” as a qualification of the scope of protected waters of the United States. Amendments have also been proposed to codify the regulatory exemption of prior converted cropland from Clean Water Act jurisdiction, and to also exempt waste treatment systems, hunting and shooting, and pesticide spraying done in accordance with product labeling. President Obama recently issued a statement supporting legislation that would broadly protect the nation's waters, consistent with full Congressional authority under the Constitution.

## II. In Regional News

### A. Overview

As many of you may know, EPA Region 2 is a complex region which consists of New Jersey, New York, Puerto Rico, the U.S. Virgin Islands and seven federally recognized Indian nations. The Region's more than 31 million residents are primarily concentrated in urban areas. Nearly 85 percent live in New York State, containing the largest and most densely populated city in the country, and New Jersey, the most densely populated state. In Puerto Rico, approximately one-third of the more than 3.5 million residents live in and around the city of San Juan.<sup>19</sup>

The Region is home to unique and largely intact ecosystems such as the New Jersey Pine Barrens, the Adirondack State Park (the largest publicly protected area in the mainland U.S.), the Hudson River, Niagara Falls, the Caribbean National Forest and the Virgin Islands National Park. These ecosystems present diverse environmental

management challenges. EPA works to ensure clean air, pure water and better-protected land. These efforts help provide for healthy communities and ecosystems, compliance with environmental regulations and environmental stewardship.<sup>20</sup>

As of this writing, Region 2 is still awaiting President Obama's appointment of a new Regional Administrator. In the interim, the Acting Regional Administrator is George Pavlou, who began his career with Region 2 in 1973, and has served as Director of the Emergency and Remedial Response Division (ERRD), and more recently as Deputy Regional Administrator.

## **B. Selected Initiatives**

### **1. Air**

The Harbor Deepening Project (HDP or Project) is a 10-year (2005–2014) dredging program that will deepen several channels in the Port of New York and New Jersey to approximately 50 feet below mean sea level. In order to offset air emissions from the Project, the Port Authority of New York and New Jersey's Port Commerce Department has supported the implementation of the Harbor Air Mitigation Plan (HAMP). The Regional Air Team, comprised of the Army Corps of Engineers (New York District), the Port Authority of New York and New Jersey, and a group of state and federal government agencies, evaluated various strategies and alternatives and chose alternatives that exceed air quality requirements and follow several concurrent strategies. These alternatives generate no net gain of nitrogen oxide (NOx) during the project and will result in regional air quality improvements well beyond the life of the project. The strategies include:

- retrofitting the Staten Island Ferry fleet with Selective Catalytic Reduction (SCR) devices;
- repowering tugboats with cleaner engines; and
- very limited use of Emissions Credits prior to retrofitting and repowering.

Based upon current calculations, the quantity of nitrogen oxide emissions required to be offset from the Harbor Deepening Project peaked at roughly 500 tons per year in 2006 and will again in 2009. The chosen alternatives (ferry, tug, and credits) are projected to provide NOx offsets of 800 tons per year starting in 2006, and increasing to 1,000 tons each year thereafter.

### **2. Superfund**

#### **a. The Passaic River Cleanup**

In January, EPA announced the selection of a cleanup plan for the first stage of a two-phased project to remove dioxin-laden sediment from the lower Passaic River.<sup>21</sup> The cleanup plan, outlined in an Action Memorandum signed by EPA on January 9, 2009, involves mechanical dredg-

ing of 40,000 cubic yards of sediment with mechanical dewatering of the sediments. The plan implements a 2008 agreement between EPA, Occidental Chemical Corporation and Tierra Solutions, Inc. under which the companies agreed to remove, in two phases, a total of 200,000 cubic yards of contaminated sediment from the portion of the river in front of the Diamond Alkali Superfund site in Newark.<sup>22</sup> The field work for the first phase is scheduled to start in 2010 after completion of engineering design work, and is expected to take approximately nine months to complete.<sup>23</sup> Further information on this project can be found at EPA Region 2's Passaic River Web site at <http://www.epa.gov/region2/passaicriver/>.

#### **b. The Hudson River PCBs Cleanup**

On May 15, after decades of study, delay, and litigation, Phase I of the Hudson River dredging project started.<sup>24</sup> The long-awaited and historic dredging of the Upper Hudson River to remove polychlorinated biphenyl-(PCB-)contaminated sediment began in Fort Edward, New York.<sup>25</sup> The dredging and related work will be conducted by General Electric (GE), with EPA oversight, pursuant to the terms of a November 2006 consent decree. At the conclusion of this first phase of the project, an independent panel of experts will review the results of the dredging and may make recommendations for modification of the project.<sup>26</sup> The first phase of the dredging is designed to remove 265,000 cubic yards of sediment and 20,300 kilograms of PCBs from a six-mile stretch of the Upper Hudson River.<sup>27</sup>

The sediment removed from the river will be carried by barge to a facility in Fort Edward, where it will be dewatered and the PCB-laden material will be loaded onto railcars for disposal at a permitted landfill facility in Texas. EPA estimates that the entire project will take six-years, remove approximately 1.8 million cubic yards of sediment and 113,000 kg of PCBs.<sup>28</sup> Further information about the Hudson River PCBs Superfund site can be found at: <http://www.epa.gov/hudson>; the latest information on the location and progress of the dredging can be found on GE's Hudson River Dredging Project Web site at <http://www.hudsondredging.com/>.

#### **c. Gowanus Canal Proposed NPL Listing**

In April 2009, EPA proposed adding the Gowanus Canal to the National Priorities List in an effort to begin a long-overdue investigation and comprehensive cleanup of the area. The mile-and-a-half-long canal, located in Brooklyn, New York, is heavily contaminated with pesticides, heavy metals and PCBs from over a century of manufactured gas plants, mills, tanneries, and chemical plants that operated along its banks.<sup>29</sup> The proposed listing has stirred up considerable debate.<sup>30</sup> While the New York State Department of Environmental Conservation requested the Superfund listing because it lacks adequate

funds to address the cleanup, the Bloomberg administration has opposed the listing, fearing both the loss of control of the process and investors pulling out of two private development projects in the area.<sup>31</sup> The involved governments, environmental organizations, local politicians and residents continue to debate how the canal should be addressed, but all can agree that a comprehensive cleanup of this highly contaminated area is decades past due. For additional information on this project, see <http://www.epa.gov/region2/superfund/npl/gowanus/>.

### **3. Water**

#### **a. Protecting Watersheds, Water Bodies and Human Health**

With the beginning of the beach season, the EPA is again undertaking a beach and harbor protection program, comprised of surveillance, sampling and funding activities, to safeguard beaches and bays in New Jersey and New York, and the health of the people who enjoy them. Using cutting-edge technologies, and working together with other federal, state and local agencies, EPA's program operates seven days a week.

The beach and harbor protection program includes shellfish bed water quality monitoring, grants to states to help with their beach monitoring and public notification programs, and the development of pollution discharge limits, called total maximum daily loads, for the New York/New Jersey Harbor and the New York Bight. From the water and from the air, EPA will sample and survey the beaches and harbors to more fully assess the influence of nutrients on dissolved oxygen levels.

For more information on this program, see <http://www.epa.gov/region02/water/oceans>.

#### **b. Reducing Major Discharges**

EPA recently levied fines against eight construction companies in Culebra, Puerto Rico for discharging construction stormwater without a National Pollutant Discharge Elimination System (NPDES) permit. Culebra Resorts Associates; Playa Clara, S. E.; Inversiones del Mercado; JOFA Contractors; Caribbean Properties Investments; VPI Construction Corp.; and Víctor Morales all face fines for failing to obtain proper stormwater permits for construction sites on the island. Alfa & Omega was fined for similar violations related to the installation of a sewer line. The companies face fines totaling \$205,500.

Clean Water Act regulations require owners and operators of construction sites larger than one acre to obtain a permit and to develop and implement a storm water pollution prevention plan, including best management practices, to minimize the amount of pollutants reaching waterways. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agri-

cultural lands, and 1,000 to 2,000 times greater than those of forest lands, and sediment discharges from construction sites can cause physical and biological harm to waterways. Two endangered species of sea turtles, the hawksbill turtle and the leatherback turtle, and one threatened species, the green turtle, inhabit Culebra's coastal waters. Elkhorn and staghorn coral, both endangered species, are also found in these waters.

For more information, see <http://cfpub.epa.gov/npdes/stormwater/swbasicinfo.cfm>.

#### **c. Ensuring Safe Drinking Water**

In 2000, EPA ordered the New York City Department of Environmental Protection (DEP) to replace mechanical equipment containing mercury, lead and PCBs along New York City's Delaware Aqueduct. The Delaware water supply system, which conveys about 50 percent of the City's drinking water, was constructed between 1937 and 1965, originates more than 100 miles north of New York City and consists of four reservoirs, Cannonsville, Neversink, Pepacton and Rondout.

The flow of water through the Delaware Aqueduct and two reservoirs along the aqueduct is controlled by sluice gates, which are raised and lowered by devices called sluice gate operators.

Though the operators contained mercury and possibly lead and PCBs, all of which pose serious health threats, elevated levels of these substances were never detected by monitoring equipment in the water system.

The order focused on 45 mechanical devices used to raise and lower sluice gates that contained mercury and possibly lead and PCBs at four stations along the Delaware Aqueduct, two in Carmel, N.Y., one in North Castle, N.Y., and one in Mt. Pleasant, N.Y. DEP had replaced 15 of the 24 devices at the Mt. Pleasant station prior to EPA's order. On February 10, 2009, the city completed the replacements, one year before EPA's February 2010 deadline.

For more information on the NYC watershed and related issues, see <http://www.epa.gov/region02/water/nycshed/> and <http://www.epa.gov/region02/water/drinkingwater/>.

#### **d. Promoting Green Remediation and Green Construction Projects**

Green remediation is the practice of considering environmental impacts of remediation activities at every stage of the remedial process in order to maximize the net environmental benefit of a cleanup. Considerations include selection of a remedy, energy requirements, efficiency of on-site activities, and reduction of impacts on surrounding areas.



"Clean & Green" is a policy established by EPA Region 2 to enhance the environmental benefits of Superfund cleanups by promoting technologies and practices that are sustainable. The policy applies to all Superfund cleanups. Under this policy, certain green remediation technologies will serve as touchstones for Region 2 response actions. For more information on this policy, see [http://www.epa.gov/region02/superfund/green\\_remediation/](http://www.epa.gov/region02/superfund/green_remediation/).

EPA recently announced that, when the New York Jets and New York Giants kick off their 2010 seasons, they'll be playing in one of the greenest venues in sports. EPA and the New Meadowlands Stadium Company, the stadium's principal owner, signed a memorandum of understanding that outlines plans to incorporate environmentally friendly materials and practices into the construction and operation of New Meadowlands Stadium in East Rutherford, New Jersey. Goals of the agreement include cutting the stadium's annual water use by 25 percent, making it 30 percent more energy efficient than Giants Stadium, increasing total recycling by 25 percent and recycling 75 percent of construction waste. All told, the agreement will prevent the emission of nearly 1.68 million metric tons of carbon dioxide during the stadium's construction and its first year of operations—the equivalent of taking more than 300,000 cars off the road for a year.

Highlights of the agreement include:

- using some 40,000 tons of recycled steel to build the stadium and recycling 20,000 tons of steel when Giants Stadium is demolished;
- installing seating made partially from recycled plastic and scrap iron;
- building the stadium on a parcel of rehabilitated land, a former brownfield;
- reducing air pollution from construction vehicles by using cleaner diesel fuel, diesel engine filters, and shortening how long engines idle;
- using environmentally friendly concrete in construction;
- reducing water consumption and increasing energy efficiency;
- providing mass transit options for fans; and
- replacing traditional concession plates, cups and carries with compostable alternatives.

The New Meadowlands Stadium Company will report the progress on its goals to EPA every six months. Based on the reports, EPA will quantify the benefits of the venue's environmental efforts. EPA has similar agreements in place with the New York Mets for the team's

new Citi Field stadium, the Destiny USA mall project in Syracuse, N.Y., the real estate firm Cushman & Wakefield, Montclair State University in Montclair, N.J., Monmouth University in West Long Branch, N.J., and St. John's University in Queens, N.Y. For more information on EPA green construction and operations agreements, visit <http://www.epa.gov/region02/greenteam/>.<sup>32</sup>

For more information on what's new in EPA, Region 2, including information on specific sites (e.g., Hudson River, Passaic River, etc.), fish advisories, daily air quality updates, emergency information, or if you want to sign-up on Twitter, please visit the EPA Web site at <http://www.epa.gov/region2/>.

## Endnotes

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**Marla E. Wieder is an Assistant Regional Counsel with the New York/Caribbean Superfund Program, and Chris Saporita is Assistant Regional Counsel with the Water and General Law Branch of the United States Environmental Protection Agency, Region 2, in New York City.**

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# DEC Update

By John L. Parker

## DEC Today: Fiscal Challenge/Fiscal Reality FY 09/10

The Department of Environmental Conservation is addressing the fiscal pressures affecting government and business, caused by ongoing financial and economic developments facing the country. The reality has significantly challenged the financials underlying New York State's budget. The mission, authority, and responsibility of DEC nonetheless continues, and is vast, requiring the simultaneous protection of public health, safety, and welfare of New Yorkers while improving and protecting the state's natural resources and environment. As federal stimulus money is spent, the mission is further defined by revitalizing New York communities through funding of new and necessary infrastructure projects. In addition to the reduced budgets, the DEC is projected to lose over 200 staff members to attrition this year. These fiscal developments are putting budgetary pressures on all aspects of DEC.

The DEC has been actively working to focus and to prioritize goals of the many program areas implemented by department staff. These efforts are being undertaken by all programs and all program areas as DEC strives to determine what can and cannot be accomplished with existing resources. The DEC is also looking at forging lasting and productive relationships with partners in the future. These realities also shape the initiatives and enforcement efforts DEC undertakes. In this context, DEC staff are working on many significant projects and advancing environmental conservation in every region of the state of New York. Here is a brief update of some of the highlights of the work of DEC.

### Hudson, Fulton, Champlain Quadricentennial

About a hundred years ago, there were commemorative events for Hudson, Fulton and Champlain that highlighted the contributions made by each to our state and nation. This year, on the 400th anniversary of Henry Hudson's initial visit to our region, New York begins the commemoration anew. With the blessing of the fleet on Friday evening, June 5, 2009, Governor Paterson, Commissioner Pete Grannis, Dutch Consul General Hugo Gajus Scheltema, and other honorees and guests commenced festivities and the flotilla of tall ships from the Statue of Liberty to Albany. On June 6, 2009, the flotilla included replicas of the *Half Moon*, *Onrust*, *Clearwater*, *Mystic Whaler*, *Woody Guthrie*, historic New York State Governor Cleveland tugboat, the historic *John Harvey* fireboat and others, and began an adventure that would commemorate 400 years of history in New York. That beautiful Saturday was profound and transformational for many who attended, and

offered the perfect opportunity to reflect on the history that has made New York State what it is today, and also to reflect on all of the developments of modern environmental law that were so profoundly shaped by the Hudson Valley and New York State. These events also brought awareness of our great river as a resource, and showed the need for much more public access to the river.

There were activities all along the shores of the Hudson River to help celebrate the initial day of the sail, and these events continue throughout the year and includes the Grand Opening of the Walkway over the Hudson (Poughkeepsie-Highland Bridge) scheduled for October 3, 2009. The schedule of events can be found at [www.ExploreNY400.com](http://www.ExploreNY400.com)

### Marcellus Shale Draft Supplemental Generic EIS

The DEC is currently in the process of reviewing shale gas development using horizontal drilling and high-volume hydraulic fracturing to extract natural gas from the Marcellus Shale and other low permeability gas reservoirs across the Southern Tier and into the Catskills. DEC is conducting an environmental study to supplement the Generic Environmental Impact Statement (GEIS) covering gas and oil drilling in New York State. The DEC has been reviewing extensive public comments, which highlighted water and wastewater management as critical issues. A number of additional topics were added in the final Scope issued in February 2009. Some additional topics include effectiveness of regulations in other gas-producing states, setbacks for multi-well sites, potential requirements for private water well sampling, mechanisms to address refracturing, air quality, and evaluation of phased permitting alternatives. The Draft Supplemental Generic EIS is expected to be issued in Summer 2009.

### Invasive Species: DEC Responses and Administrative Actions

Invasive species are non-native species that can cause harm to the environment or to human health. Invasives are a threat to our biodiversity judged second only to habitat loss. The DEC has taken active steps to address invasive species cases as they occur, and to take administrative action to avoid future impacts, particularly regarding the ballast water found in ships that travel the globe. These efforts are particularly important because international trade and globalization have accelerated New York's contact with these invasive species.

An excellent example of the active role of DEC occurred in May 2008, when Fisheries staff responded to a report by a local fisherman of an invasive species in



Orange County. DEC conducted an investigation and verified the presence of the Northern Snakehead (*Channa argus*), a species native to Asia. Northern Snakeheads are an aggressive predator that could rapidly expand their population and territory. The result of this expansion would be two-fold: negative economic impacts to the Hudson River watershed fisheries, and potentially irreversible harm to rare and endangered species and natural communities. The DEC took emergency action to treat the impacted waters with aquatic pesticide. Prior to the treatment, DEC staff removed native fish and held them in storage for lake restoration. The restoration activities began in August 2009 and continue.

The DEC has also taken administrative action to address harmful aquatic invasive species on a larger scale, in the form of a Clean Water Act § 401 certification for Commercial Vessel and Large Recreational Vessel General Permit (VGP). International shipping has been a source of many invasive species, particularly those found living in ballast water brought from abroad and discharged into New York waters. An example of this phenomena are zebra mussels, which are a costly and widespread invasive that impact our state's waterways and associated infrastructure. The § 401 water quality certification in this case was necessary for the U.S. EPA VGP to take effect in New York State's waters by the December 19, 2009 deadline required by a recent change in federal law. It was issued by DEC in February 2009, and was promptly challenged in Albany County Supreme Court.

The DEC § 401 certification in this case illustrates the types of actions necessary to address invasives proactively. Specifically, there were three conditions that were challenged in the lawsuit: Condition One, requiring that all ships entering New York waters with ballast water on board must travel 50 nautical miles from the coastal shore into the Atlantic Ocean into waters at least 200 meters in depth in order to exchange the water in their ballast tanks with ocean salt water; Condition Two, requiring all existing ships covered by the VGP operating in New York waters be retrofitted to install ballast water treatment systems meeting specifically established standards by 2012; and Condition Three, requiring that all vessels constructed after January 2013 covered by the VGP and operating in New York waters must include a ballast water treatment system meeting specific standards. The DEC effort to address invasives in ballast water in the § 401 water quality certificate was upheld on this initial court challenge.<sup>1</sup>

### **Wildlife Enforcement: Operation Shellshock**

In March 2009, the department announced the result of an extensive investigation that uncovered an international black market for poaching and selling protected New York species. These species include turtles, rattlesnakes, and salamanders that are sold overseas—as far away as China—for meat and other uses. The DEC's

Bureau of Environmental Crimes Investigation (BECI), reconstituted by Commissioner Grannis, spent hundreds of hours putting the case together, and the international investigative effort involved officials in several jurisdictions including Pennsylvania, New Jersey, Florida, U.S. Immigration and Customs, the Attorney General's Office, Environment Canada, and Ontario Ministry of Natural Resources.

The investigation was the most extensive undercover operation ever undertaken by DEC and involved more than 2,400 individual turtles, snakes, and salamanders. The activities of the individuals involved violate Environmental Conservation Law § 71-0924, among others. The DEC efforts also resulted in the U.S. Attorney's Office for the Western District of New York pursuing Federal Lacey Act charges against a Maryland meat processor for the knowing purchase of illegally trapped New York snapping turtles. The list of confiscated species includes snakes (timber rattlesnakes, copperheads, and eastern hognose snakes) and turtles (snapping turtles, Blanding's turtles, box turtles, North American wood turtles, and two Yellow-spotted Amazon River Turtles). Charges have been filed against 18 individuals for 14 felonies, 11 misdemeanors, and dozens of violations.

### **SEQRA, Greenhouse Gases and the Environmental Assessment Form**

On March 11, 2009, DEC's Office of Air Resources, Climate Change & Energy published notice of its draft program policy—Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements—in the *Environmental Notice Bulletin*. The draft is the second version of a proposed program policy that was circulated for informal stakeholder review in the fall of 2008, and the public comment period ended April 10, 2009. DEC staff are reviewing the public comments to determine what, if any, changes should be made to the draft program policy, and they expect to publish any changes in Summer 2009.

This proposed program policy will apply whenever DEC is the lead agency for a project or proposal that must be studied via an environmental impact statement (EIS). The draft provides instructions to DEC staff on how to include analyses of energy use and potential greenhouse gas (GHG) emissions within an EIS when DEC is the lead agency. The proposed policy identifies the boundaries and methods for the assessment of energy demand and GHG generation, and offers an illustrative list of avoidance and minimization measures that can be included in developing alternatives and mitigation to be addressed in an EIS.

The proposed program policy does not address the "determination of significance" under SEQRA, namely, when potential energy demand or GHG generation would be "significant" enough to trigger a requirement to prepare an EIS. That initial assessment of potential

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energy demand and GHG generation is included, along with numerous other changes, in a proposed revision to the environmental assessment form (EAF). DEC staff is developing the revised EAF as a parallel effort to the development of the draft program policy. Because the EAF is included within the SEQRA regulations, the proposed revisions will be subject to the State Administrative Procedure Act rulemaking procedures.

## New York State Open Space Conservation Plan

Also this summer, Governor Paterson is expected to release the 2009 edition of New York's Open Space Conservation Plan. The public comment period on the plan closed on February 27, 2009. The Plan is the "blueprint" for New York's land conservation efforts, and is revised every three years. New York has invested more than \$762 million during the past several years under the open space planning effort, and over a million acres of land have been conserved.

New York's Open Space Conservation Plan provides four overarching objectives to direct DEC priorities, policies, and actions. These include: Responding to Climate Change; Fostering Green, Healthy Communities; Connecting New Yorkers With Nature and Recreation; and Safeguarding Our Natural and Cultural Heritage. The plan identifies a number of actions that DEC can pursue for each objective, and includes a list of associated programs and policies. The plan also contains a statewide list of priority conservation projects that are eligible for funding through the Environmental Protection Fund (EPF). More information about the Open Space plan can be found on the department's Web site at [www.dec.ny.gov/lands/317.html](http://www.dec.ny.gov/lands/317.html).

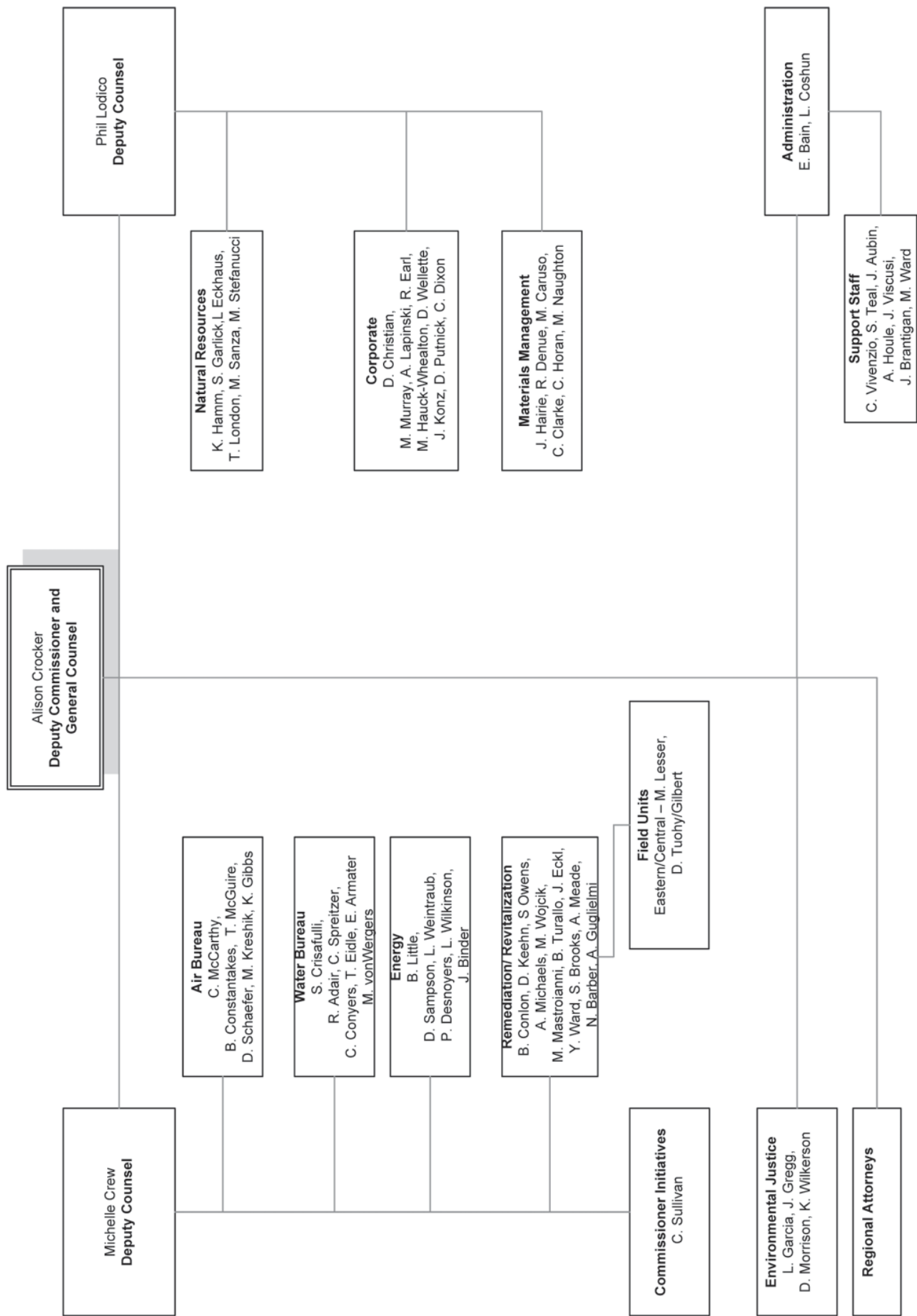
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**John L. Parker is a Regional Attorney with the Department of Environmental Conservation, Region 3.**

*The DEC Update was compiled by John Parker solely in his individual capacity, is not a publication prepared or approved by the Department of Environmental Conservation, and the views are not to be construed as an authoritative expression of the DEC's official policy or position with respect to the subject matter discussed.*

# OFFICE OF GENERAL COUNSEL



Updated on 06/09



# Member Profiles



**Prof. Philip Weinberg**

## **Long-time Member: Professor Philip Weinberg**

Philip Weinberg, Professor of Environmental Law and Constitutional Law at St. John's University School of Law, has been a member of the New York State Bar Association's Environmental Law Section since its founding in the 1970s. He was the Section Chair for the 1988-89 term.

Ahead of his time, Phil founded the Environmental Protection Bureau within the Office of the New York State Attorney General, which Bureau he headed from 1970 to 1978. Before that he worked in the Attorney General's Litigation Bureau, where he argued three appeals in the U.S. Supreme Court and numerous appeals in the New York Court of Appeals and other appellate courts. There were eight attorneys and two scientists in the Environmental Protection Bureau at its beginning; now the bureau employs over 40 attorneys and 10 scientists. What began as enforcement based in common law nuisance, trespass, and negligence grew, under Phil's leadership and since, into the enforcement of both state and national environmental laws addressing global warming, smog reduction, water pollution, the cleanup of lakes, rivers and coastal waters, the protection of wildlife and other natural resources, and the safeguarding of our health and general welfare. He fought and succeeded in convincing the New York State Court of Appeals to uphold the Mason Law, a state statute that makes it unlawful to sell skins and hides of endangered species, and in doing so he defeated a Constitutional due process challenge. In its decision, the Court stated that "protection of animals listed in the Mason Act is necessary not only for their natural beauty and for the purpose of environmental study, but for the key role they play in the maintenance of the life cycle." The decision appealed to states' rights advocates and environmentalists alike.

Phil continues his tradition of leadership and service on the Law Committee of the Municipal Art Society of New York, and the board of the New York City Environmental Law Leadership Institute. In addition to being a past Chair of the NYSBA Environmental Law Section, he has chaired the New York City Bar Association's Committees on Environmental Law, International Environmental Law, and Transportation Law, as well as the Environmental Law Section of the Association of American Law Schools. Phil is a frequent lecturer on environmental issues and has appeared on radio and television to discuss Constitutional issues.

An accomplished author and editor, from 1984 to 2008 Phil wrote the Practice Commentary to *McKinney's*

*New York Environmental Conservation Law*, and authored an environmental law casebook, as well as numerous articles on environmental law and Constitutional law. He is a co-author of *Understanding Environmental Law* (Matthew Bender, 1998), and of *Environmental Impact Review in New York*, and he is an editor of *Environmental Law and Regulation in New York*, among other books, articles, and treatises.

Phil has helped to make this Section what it is today. Thank you, Phil.

## **New Member: J. Cullen Howe**

The New York State Bar Association Environmental Law Section is proud to announce its inaugural year of blogging! EnviroSphere is the blog created and managed by the Environmental Law Section, and headed by one of our esteemed members, Mr. J. Cullen Howe. As the blog administrator, Cullen is responsible for the management and content therein, and is always looking for enthusiastic lawyers' input. You do not have to be a professional author to blog; all you need is a computer and something to say. Check out the blog at <http://nysbar.com/blogs/environmental>. Also, feel free to contact Cullen at [J.Cullen.Howe@aporter.com](mailto:J.Cullen.Howe@aporter.com).

Cullen is an environmental law specialist in Arnold & Porter LLP's environmental practice group, focusing on climate change, green buildings, and state and federal environmental laws.

He is the managing editor of *Environmental Law in New York*, a monthly newsletter, and edits the *Environmental Law Practice Guide*, *Brownfields Law and Practice*, as well as *Environmental Impact Review in New York*. He recently co-authored chapters on climate change and green buildings for the *Environmental Law Practice Guide*. Additionally, he is the co-editor of an upcoming book, *The Law of Green Buildings*, to be co-published by the American Bar Association and the Environmental Law Institute in the fall of 2009.

Cullen sits on the Board of Advisors for the New York City Environmental Law Leadership Institute (NYCELLI), an annual seminar for new environmental attorneys committed to leadership in the field of environmental law.

Prior to joining Arnold & Porter, Cullen practiced for six years at two litigation boutiques in Manhattan, where he focused on commercial litigation and employment law. He is a graduate of Vermont Law School, where he was the managing editor of the *Vermont Law Review* and graduated cum laude with a JD and a Master of Studies in Environmental Law. He received his bachelor's degree from DePauw University, where he was a member of Phi Beta Kappa.

# Member News



**Rocco Cordisco**

**Dominic Cordisco**, Co-chair, Mining and Oil & Gas Exploration, and his wife announced the birth of their son, Rocco, on April 19, 2009. Rocco weighed in at 7 pounds 9 ounces. All are happy and doing well.

\*\*\*

**Yvonne Marciano**, Co-chair, Task Force on Legal Ethics, was named partner at The West Firm, PLLC. Yvonne joined the firm in September 2007. Her practice concentrates primarily in the area of environmental law. She is currently engaged in a project with the U.S. Army Corps of Engineers in Washington, D.C. regarding nationwide permitting practices and procedures for linear energy projects.

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**Yvonne Marciano**

Long-time Section member and NYSDEC SEQRA Counsel, **Larry Weintraub**, and Elena Kulikova were married on June 20, 2009. Congratulations and best wishes to the newlyweds.

\*\*\*

**Jennifer Hairie**, Co-chair, Energy, and husband, Brian Maglienti, welcomed their baby girl, Sabrina, on June 25, 2009. Sabrina weighed 7 pounds, and was 19¾ inches on her birth date. Congratulations to the proud parents.

\*\*\*

**Miriam Villani**, Editor-in-Chief, *The New York Environmental Lawyer*, and Past Chair, NYSBA Environmental Law Section, has joined the Long Island law firm of Sahn Ward & Baker, PLLC as Partner. Miriam concentrates her practice on environmental law. Before joining Sahn Ward & Baker, she was counsel in the environmental practice groups at two prominent Long Island law firms after beginning her legal career as an Assistant Regional Counsel for the U.S. Environmental Protection Agency, Region 2.



**Miriam E. Villani**

## Do You Have News You Want to Share with Your Colleagues?

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# Zoning and Land Use

To some practitioners, zoning and land use law is a rarely encountered remnant of bar review courses of years gone by. To others, it is a specialty to which their careers are largely devoted. For the vast majority, however, it falls in the middle. For them, the zoning and land use process may be tangential to a commercial development or real estate matter, or perhaps comes into play when a client is concerned about a proposed project in his or her neighborhood which could potentially impact the neighborhood setting or quality of life.

*Zoning and Land Use* is devoted to the latter practitioners, who need to understand the general goals, framework and statutes relevant to zoning and land use law in New York State. With numerous practice guides, it is intended to provide a broad discussion of zoning and land use in New York State and, above all, to remove the mystique surrounding this practice area. Traditional zoning laws as well as other land use regulations are covered. Numerous practice guides make this reference even more useful.

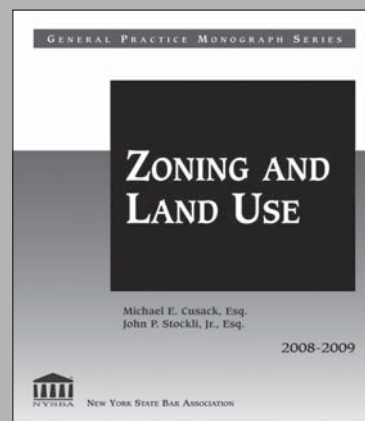
In addition to updating case and statutory references, this latest edition discusses the legislation which allows town, city and village boards to create alternate member positions to replace members who are unable to participate due to conflicts of interest, and includes discussion of current case law regarding public hearings, application approvals, and repeated denials of an application which constitute a temporary taking.

The 2008–2009 release is an entire reprint current through the 2008 New York State legislative session.

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# Present and Future Risks of the Green Construction Movement

## Addressing Risks in the Design, Construction and Operation of Green Buildings

By Rodney Taylor and Howard Tollin

### Introduction

The design, construction and operation of buildings are key factors in achieving sustainable development. The built environment provides economic, social and environmental benefits, but it also has the potential for adverse environmental impacts. The operation of buildings and the construction sector typically provide 8% to 10% of employment in advanced nations and generate a similar percentage of Gross Domestic Product.<sup>1</sup> People in these societies spend as much as 90% of their lives in their homes, office buildings, factories, retail stores, schools and other buildings, so it is difficult to overstate the importance of the impact these structures have on the quality of their lives.

At the same time, the building and construction industries are hungry consumers of raw materials, energy and land resources. Globally, this sector is responsible for 30% to 40% of energy use, consumes up to 70% of electricity generated and emits more than 38% of all greenhouse gases released into the environment.<sup>2</sup> This is a greater percentage than industrial operations or transportation, which are the next largest sources of greenhouse gases. Operations of buildings and the construction trades also use more than 14% of all potable water supplies and account for 40% of all material and energy use.<sup>3</sup> Considering these statistics, it is obvious that better design, construction and operation of buildings has the potential to be a material factor in reducing emissions of greenhouse gases that are contributing to global warming. Better selection of materials and better design can also reduce the demand for natural resources and reduce waste volumes sent to landfills.

### What Are Green Buildings?

Green buildings are those that incorporate technologies and design features that allow them to use less energy, emit less CO<sub>2</sub>, generate less waste and utilize recycled and recyclable materials. At the same time, these structures are protective of occupant health and improve employee productivity. Typical high-performing buildings use 20% less energy,<sup>4</sup> as much as 40% less water and emit 25% to 40% less CO<sub>2</sub> than average conventional buildings.<sup>5</sup> Performance for the best green buildings may be 50% better than ordinary buildings.<sup>6</sup> The United States is expected to add 170,000 new nonresidential buildings each year for the next decade, while approximately 44,000 old buildings will be torn down each year. On the residential side, 2009 will see less than a million housing

starts in the United States, down from the peak years of 2006 and 2007. Less than 2% of commercial construction and less than 1% of residential construction will consist of "green buildings," but these percentages are increasing every year.

Considering the situation from a global perspective, the picture is not much different. Of 2,500 LEED<sup>7</sup> certified buildings in the world, 2,200 of them are in the United States, 70 are in Canada, 20 are in China and there are less than four dozen in the European Union Nations. There are a number of other certification programs that are used in the United States and in other countries, so the number of high-performing buildings being constructed is somewhat higher than would be indicated by a review of statistics for LEED certified buildings alone.<sup>8</sup> While the use of advanced building design and technology in emerging nations is far behind North America and Europe, the building programs in nations such as China and India dwarf those of the more industrialized nations. For example, China will have 10 million to 12 million new housing starts a year for at least the next 20 years.<sup>9</sup> The Chinese Ministry of Construction estimates that more than 2 billion (m<sup>2</sup>) of new commercial space was constructed in the most recent year for which statistics were available (2005) and that building has taken a sharp turn upward since then. They expect the current stock of buildings to double by the year 2030 and are driving to add energy conservation features to a significant percentage of new construction projects. Current surveys indicate that less than 1% of Chinese construction incorporates green building features.

### How Are Green Buildings Different from Conventional Ones?

Green buildings are designed, constructed and operated to enhance environmental and economic performance while boosting productivity of workers by providing a healthy and aesthetically pleasing indoor environment. An integrated design approach addresses the following factors that are used to evaluate and rate green buildings:

- Site selection and development
- Water conservation
- Energy efficiency and the use of renewable energy sources
- Indoor environment and air quality

- Use of renewable and recyclable resources
- Innovation in design and construction

In the United States, most green buildings that are formally certified as high performing utilize the USGBC LEED system referred to above. This program was completely overhauled in 2009 and has several rating categories that include certification for new construction, retrofitting of existing buildings, commercial interiors and building shells. LEED also provides certification for specific categories of occupancy including residential, schools and retail buildings. There are four ratings based on points awarded for a variety of construction features, with a total of 110 possible points in all construction categories. The following ratings are awarded based on the cumulative points achieved by design and construction features:

- |                  |                     |
|------------------|---------------------|
| • LEED Certified | More than 40 points |
| • LEED Silver    | More than 50 points |
| • LEED Gold      | More than 60 points |
| • LEED Platinum  | More than 70 points |

The points are awarded for achieving milestones in each performance category but there are some prerequisites that are mandatory. These include erosion and sedimentation control in the site development category, minimum energy performance criteria, greenhouse gas and chlorofluorocarbon (CFC) reduction<sup>10</sup> in the energy and atmosphere categories, and minimum indoor air quality performance. The largest credits given are for optimizing the energy performance of the certified building.

New for 2009 and years thereafter are additional incentives for reducing impacts on human health and the environment. The program has also introduced a regional credit of up to 10 points for specific environmental goals that are not uniform across the United States. These might include runoff of contamination into the Great Lakes in the upper Atlantic States or reduced fuel load for buildings constructed in Western States where wildfires are a growing threat.

## Benefits of Green Buildings

High-performing buildings offer developers, owners, tenants and other interested parties far more than just energy savings and lower emissions of greenhouse gases. A recent study of data from more than 2000 green buildings by Norman Miller of the University of San Diego indicated that commercial buildings with either an Energy Star<sup>11</sup> or LEED certification had 2% better occupancy rates and rented for \$2 a square foot more than conventional structures of the same age in the same rental markets. High-performing buildings sold for a premium of 30% over non-certified buildings and were in strong demand even in a weakening real estate market.<sup>12</sup>

Workers of all ages, and especially younger ones, expressed a strong preference for working in green buildings and their appeal has been helpful to many employers in attracting and retaining employees that are replacing the retiring generation of baby boomers. Other surveys indicate that workers are more productive in certified green buildings, which can easily pay for the higher cost of specifying high-performing materials and components. They also take less time off for health and medical problems, primarily due to improved conditions for those impacted by allergies and respiratory ailments such as asthma.<sup>13</sup>

Media attention on healthy indoor environments and energy conservation has made every sector of the economy aware of the public's interest in curbing emissions of greenhouse gases and using all types of natural resources more efficiently. Best Buy announced recently that all of its future stores would be LEED certified and Wal-Mart has begun to construct many of its buildings to incorporate green building features. Some tenants specify a preference for space in certified office buildings and several property owners now have several green buildings in their portfolios of rental properties in every major city.

Several states, counties and cities<sup>14</sup> have passed legislation that requires all new public buildings in their jurisdictions to be LEED certified. This includes administration and office buildings, public schools and places of assembly. Federal agencies, including the General Services Administration, the Department of Defense, the Department of Energy, the State Department and the Environmental Protection Agency have also mandated the use of high-performing structures for all new facilities constructed or leased by these entities. For private construction, there are a number of incentives to encourage the use of green building design and technologies, including low-interest loans, allowance for greater density of buildings, the physical form of development approved, grants and tax rebates. There are also large pools of investment money that have been earmarked for environmentally friendly projects.

In a survey of green building owners conducted by Deloitte,<sup>15</sup> the primary motivation for seeking certification was not related to the cost savings over the lifecycle of the property. In fact, this factor rated fifth among those that were frequently cited by the respondents. The primary considerations of owners were: (1) improvement of indoor air quality; (2) corporate environmental commitments; (3) value of public relations and free publicity; (4) brand identification and enhancement of reputation; and (5) energy savings and efficiency.

## Risk Issues in the Green Building World

In addition to the traditional risks associated with the design, construction and operation of buildings, a green building project may present unique risks that are not

common to projects involving conventional structures. For **owners**, these may include: (1) not being able to get the building certified or not achieving the expected level of certification; (2) being unable to qualify for a tax credit that is contingent upon certification; (3) not meeting requirements to qualify for a loan or green building incentive; and (4) increased soft costs due to delays in completion or the requirement for additional documentation. For **design professionals**, green building risks may include: (1) a higher standard of care due to the requirement that LEED certified individuals participate in the process; (2) design defects that result in the failure to achieve certification or the level of certification promised; and (3) liability arising out of the operating phase due to systems or components that do not perform as intended over the life cycle of the structure. For **contractors**, green building risks include: (1) failure to deliver features or performance promised in the construction contract; (2) construction defects; and (3) failure of the completed structure and systems to perform as intended over the lifecycle of the building.

Green buildings create new risks primarily by altering the expectations of the parties. Expectations regarding the benefits of green buildings have been created by public attention and daily media reports that have focused on energy efficiency, healthy indoor environments and employee productivity. Owners and developers that are considering making the investment of time and money in green design and construction expect that this investment will pay off by delivering these reported benefits. Green buildings achieve these results though the use of new technologies that alter the way buildings are designed, constructed and operated and new materials that improve performance of systems and extend the lifespan of the structures. The process of commissioning assures that all of the improvements are installed and operating as intended.

Green buildings involve an investment premium that varies from less than 2% to more than 10% when compared to the costs of conventional construction. Building costs are made up of three components:

1. **Soft Costs**—Costs associated with the permitting, design and financing of a construction project. These include the investigation of site conditions such as subsurface geology and environmental hazards, costs for engineering and design work to develop the building plans and specifications, legal costs of title search, permitting and contract drafting, costs for construction loans and permanent financing and taxes associated with the purchase of the property or its development.
2. **Hard Costs**—Costs associated with construction including all direct and indirect labor of the prime contractor and subcontractors of every tier. Hard costs also include the costs of materials,

components and equipment required to execute the architect's design, including transportation of materials, components and equipment to the site. Other direct costs include the cost to provide safety programs and insurance for physical damage, third-party liability, workers' compensation and other risks associated with construction activities.

3. **Operating and Maintenance Costs**—Costs of operating the completed structure, including energy costs, lighting, water, cleaning, maintenance and security. It also includes the costs of alterations made during the life of the structure to accommodate the needs of occupants which may change over time, especially in tenant-occupied structures. Insurance costs as well as the costs of uninsured losses are also included in the operating costs of a building.

Developers expect soft costs of green buildings to be greater than for conventional construction due to the increased attention to details required to assure the incorporation of features necessary to achieve a specified level of certification. There is also the extra cost of certification itself which requires paying an architect or engineer to verify that the necessary components and features required by the rating system are present and operating as intended. Increased building efficiency is also expected to come at a cost to the owner or developer. Where more insulation is used, an additional cost is incurred. High-performance heating, ventilation and air conditioning (HVAC) systems cost more than conventional equipment. The same is true for windows with higher insulation ratings and for better roofing systems.

The owner invests in these components and services with the expectation that lifecycle costs will be reduced. Studies indicate that energy savings will be on the order of 30% to 50% depending on the level of certification and the location of the building. Water costs are supposed to be lower by as much as 50% to 70% where low-flow plumbing fixtures have been installed and water is captured from the roof and parking lots for use in landscaped areas. Other savings are promised in cleaning and maintenance costs.

Once the building is completed, the owner of a commercial building expects more rapid leasing of space and higher lease rates as well as lower turnover of tenants. For owner-occupied structures, employers anticipate lower rates of absenteeism and fewer health problems. They also are told they can expect improved productivity from their employees and the ability to attract and retain the workers they want. Insurance costs should be lower for the improved risk profile and the better class of owners and tenants that occupy green buildings. When the time comes to sell the property, the green building is expected to command a higher price and be easier to market than a conventional structure in the same market.



If these expectations are not met, owners, developers and tenants are likely to seek redress from the parties involved in the process of designing, constructing, equipping and operating the buildings.

Several green building risks are associated with the selection and development of the building site. With new construction, the site can be selected to provide several advantages commonly associated with green construction. First, it can be located near public transportation routes to increase access and reduce the need for commuting by automobile. A new building can also be integrated with its site to take advantage of solar heating and daylight as well as proper orientation with respect to prevailing winds. Where alternative transportation is planned, the structure can be designed to accommodate bicycles, hybrid, natural gas-powered and electric cars.

Site risks may include zoning and permitting, especially where a change in use requires upgrading land use from industrial to commercial or residential occupancies. Where industrial properties have been impacted by historic operations involving hazardous materials, additional due diligence is required to characterize pollution conditions and additional costs will be incurred to clean up and dispose of contaminated soil. Groundwater contamination may involve expensive treatment systems that may limit the use of portions of the site where collection and treatment equipment must be installed. Petroleum and chlorinated solvents in groundwater may take years to remediate and the process may cost millions of dollars over the life of the building. If vapor barriers are not installed, soil and groundwater contamination can also affect the air quality within the building, resulting in loss of productivity, health issues and employee complaints.

Energy factors represent the greatest risk for parties engaged in the development of a green building project. Energy efficiency is measured against standards promulgated by the air conditioning and lighting industries and involves the building envelope, water heating systems, HVAC equipment, lighting, power distribution systems and electrical equipment and appliances. The investment in better insulation, more effective glazing, innovative roof systems (including reflective and vegetative surfaces), electrical control equipment, low-energy lighting and HVAC equipment to achieve certification may exceed all other costs of upgrading to green status combined. Some owners report cost increases of more than \$1 million for the mechanical upgrades alone and an equal amount for other energy efficiency measures. Installation of on-site power resources such as photovoltaic panels, wind generators or energy cells will add even more to the cost of achieving energy efficiency.

The expected return on investment for energy upgrades is also the largest single factor that makes green buildings an attractive investment from a standpoint of payback over the lifecycle. A recent study of energy saving in LEED certified buildings<sup>16</sup> revealed the following

relationships between LEED criteria, energy savings and costs:

ENERGY EFFICIENCY CRITERIA	LEED CERTIFIED	LEED SILVER	LEED GOLD
Energy Efficiency	8%	30%	37%
On-Site Renewable Energy	0%	0%	4%
Green Power	10%	0%	7%
Total Efficiency Gains	18%	30%	48%
Related Cost Premium	1%	2%	2%

Another study that is summarized in the World Business Council for Sustainable Development Energy Efficiency Report<sup>17</sup> provides data derived from the operation of green buildings over a 23-year period. This report shows the average annual return on investment in green energy upgrades for all classes of buildings was 10%, which means a high-performing building will pay for the cost differential in 10 years through savings in operating costs.

A study by the New Building Institute which analyzed the energy performance of 121 LEED New Construction Certified buildings provides critical information regarding the link between intention and outcome with respect to energy efficiency in these green building projects. The LEED program awards points based on the predicted energy cost compared to a modeled code baseline building.<sup>18</sup> Measured energy savings for the buildings in this study averaged 28% better than code baseline. A quarter of the green buildings showed energy savings of more than 50%. At the opposite extreme, several buildings used more energy than the code baseline model predicted. Variations from expectations are likely to come from one or more of the following factors:

- Operational practices and schedules
- Equipment that performed below ratings
- Construction changes that impacted energy use and saving
- Type of project (high energy use occupancy)
- Improper installation and maintenance

If a developer or owner finds that his or her green building is not producing savings, but is in fact performing at a level below that of a conventional building, the situation is ripe for a claim for professional liability against the architect or for construction defects against the contractors and subcontractors. Design errors and omissions claims may be filed against the principal architect on the project and/or against engineers and consultants who participated in the design of the building and its components. Even a well designed building may fail to meet performance expectations for a number of reasons including poor execution of a well-conceived plan by the contractor.

## Claims for Failure of Green Buildings to Meet Expectations

Where newly constructed or retrofitted buildings fail to measure up to the expectations of developers, owners or tenants, these parties might bring claims against the architects and engineers who developed the plans and specifications, the contractors and subcontractors who executed those plans or building managers who take control of the mechanical systems and perform maintenance activities on the completed structure. Where the building fails to meet requirements for initial certification or it fails to achieve the anticipated level of certification, the parties may seek the modifications required to correct the deficiencies.

There are two ways that liability may be created for parties that fail to perform as promised. The first is by the terms of the contract itself, which may take the form of an express warranty where the outcome of the party's activities is specified. For example, if an architect promised in a written contract with an owner to design a building that achieves LEED Silver certification, the owner could sue the architect for breach of contract if the building fails to achieve the promised level of certification. The owner can anticipate a problem in obtaining a remedy from the architect even if liability is legally established. Architectural firms are typically rich in talented people but poor in assets. Obtaining a judgment that requires them to make the necessary corrections to achieve the promised outcome may result in the firm or individual declaring bankruptcy—and the promise of performance will remain unsatisfied. The lack of assets to pay for errors and omissions is why architects and engineers purchase professional liability insurance. The discussion below will look at the protection provided to the parties involved in green building projects by these policies.

A second way that liability may be created is by the operation of statutory or common law. Statutory liability is more likely to apply to contractors than to design professionals, but it is difficult to imagine circumstances under which there would be a statutory obligation for the contractor to meet the performance requirements of a green building program. Common law is the basis for tort liability, which may apply to any party that fails to meet the standards of customary or reasonable behavior. A claim under common law could impose liability on either architects or contractors for their failure to measure up to the standards of their professions. This may be an avenue to seek redress if the building is so defective that it clearly fails to meet the expectations of reasonable people with respect to its utility for an intended purpose. Where tort liability is legally established, an owner or tenant may seek an appropriate remedy at law.

Damages under tort or statutory liability might include the additional costs of heating, power consumption or water as a result of the building systems performing at below expected levels. Higher operating costs and

failure to meet indoor air quality expectations might also result in loss of rents where tenants refuse to move into the deficient building or vacate space already occupied. Current tenants might also bring actions for bodily injury as a result of alleged unhealthy conditions for employees, customers or visitors.

Where buildings fail to meet requirements for certification, owners may be subject to other consequences, including the loss of tax credits, noncompliance with density requirements that were altered for high-performing structures, and breach of loan covenants where the lender required the building to be certified. The owner may also be in breach of contract provisions in leases where tenants have been assured that they are occupying a green building. Correcting most of these problems will require upgrades that allow the building to meet the minimum requirements for certification. Damages will include the costs of reapplying for and achieving certification.

## Claims Against Architects and Engineers

Claims may be filed against the architects and engineers involved in the design of the green building by the developer, owner or tenants who allege that the structure is failing to meet the performance criteria associated with a high-performance building. Such a claim would presumably trigger coverage under professional errors and omissions policies purchased by these individuals and entities. The insuring agreement of the typical professional liability policy reads as follows:

The Company will pay on behalf of the **Insured** those sums . . . that the **Insured** shall become legally obligated to pay as **Damages** because of **Claims** for a **Breach of Professional Duty** in the performance of **Professional Services** rendered to others by the **Insured**, or by any entity for which the **Insured** is legally liable.

For this coverage to apply, all of the following conditions must be satisfied:

1. The **Breach of Professional Duty** forming the basis of the **Claim** must arise from **Professional Services** that take place subsequent to the Retroactive Date specified in . . . the Declarations and prior to the end of the **Policy Period**.
2. The Breach of Professional Duty must arise from Professional Services rendered in connection with the Covered Project.
3. Prior to the Effective Date of this policy, no officer, director, principal, partner, project manager, insurance manager or risk manager of the **In-**

Insured had knowledge of such actual or alleged **Breach of Professional Duty** or circumstance likely to give rise to a **Claim** under this policy. The **Claim** must first be made against the **Insured** during the **Policy Period** or Extended Reporting Period.

5. The **Insured** must report the **Claim** to the **Company**, in writing, as required by this policy. Any **Claim** so reported will be deemed reported during the **Policy Period** if so reported no later than the expiration of the Extended Reporting Period.<sup>19</sup>

Besides being overly complex, this policy is full of defined terms, exclusions and conditions that narrow the scope of coverage. Of particular importance with respect to green building claims are the following:

- Definition of “**Breach of Professional Duty**” which means negligence, which is the failure to meet the professional standard of care legally required or reasonably expected under the circumstances in the performance or non-performance of **Professional Services** rendered to others by the **Insured** which result in **Damages** for which the **Insured** is legally liable.
- Definition of “**Professional Services**” which means those services that the **Insured** is legally qualified to perform for others in their capacity as an architect, engineer, land surveyor, landscape architect, Agency Construction Manager, or as specifically defined by endorsement to this policy.
- The exclusion of warranties, which reads as follows:

This policy does not provide coverage and the **Company** will not pay **Claim Expenses** or **Damage** for any **Claim** based upon or arising out of any express warranty or guarantee; however, this exclusion shall not apply to **Damages** or **Claim Expenses** resulting from the failure to meet such warranty or guarantee if such **Damages** or **Claim Expenses** would have resulted in the absence of such express warranty or guarantee.

An architect’s promise to design a building that will achieve a specified level of LEED certification is an express warranty whether it is done in writing or verbally. Since the design professional would not be under an obligation to meet the certification criteria in the absence of such a promise, the guarantee falls within the exclusion cited above.

Owners and contractors seeking to recover damages for green building claims from design professionals should remember that it is relatively difficult to prove a breach of professional duty, which is required under the architects and engineers professional liability policy. Such proof requires expert testimony that conclusively demonstrates that the insured design professional has failed to meet the standard of a similar professional performing like tasks in the same geographic area. In the absence of a collapse of a structure or other obvious design failure, it is not common for courts to find architects have breached their professional duty.

## Claims Against Contractors

Property owners, developers and tenants of green buildings may also make claims against the contractors and subcontractors that constructed the structures when performance fails to measure up to their expectations or a building fails to achieve the expected level of certification under a green building rating program. Claims against these parties may be based on allegations that the contractors failed to properly execute the designs provided to them by the architects, that construction defects introduced by the contractors and subcontractors were responsible for the structures’ failures to perform as intended, or that the equipment they provided (HVAC, plumbing, window systems, etc.) was incapable of achieving the objectives of the owners and the design professionals.

Claims of this nature could possibly trigger coverage under commercial general liability (CGL) and excess liability policies purchased by the contractors and subcontractors providing construction services on the allegedly defective building. The insuring agreement from a typical CGL policy<sup>20</sup> reads as follows:

The Insurer will pay on behalf of the **Insured** all damages the **Insured** becomes legally obligated to pay by reason of liability imposed by law or assumed by the **Insured** under an **Insured Contract** for:

- A. **Bodily Injury** or **Property Damage** covered by this Policy that takes place during the **Policy Period** and is caused by an **Occurrence**. . . .

The other provisions of the policy that are important in determining whether coverage will be afforded in response to claims arising out of an underperforming building include the following:

The definition of **Property Damage** reads as follows:

**Property Damage** means:

- (a) physical injury to or destruction of tangible property, including all re-



sulting loss of use of that property. All such loss of use will be deemed to occur at the time of the physical injury that caused it; or

- (b) loss of use of tangible property that is not physically injured or destroyed. All such loss will be deemed to occur at the time of the physical injury that caused it. . . .”

- The definition of **Occurrence** reads as follows:

**Occurrence** means:

With respect to **Bodily Injury** and **Property Damage** . . . , an accident, including continuous or repeated exposures to substantially the same general harmful conditions. All damages arising out of the same or related acts or omissions of the **Insured** or out of one lot of goods or products manufactured, prepared or acquired by the **Insured** shall be deemed to arise out of one **Occurrence**.”

- The definition of **Products and Completed Operations Hazard** reads as follows:

**Products and Completed Operations Hazard** means all **Bodily Injury** and **Property Damage** occurring away from premises the **Insured** owns or rents and arising out of the **Insured’s** products or **Insured’s Work** . . .”

- The definition of **Insured’s Work** reads as follows:

**Insured’s Work** means work or operations performed by or on behalf of the **Insured** and materials, parts or equipment furnished in connection with such work or operations. **Insured’s Work** includes warranties or representations made any time with respect to the fitness, quality, durability, performance or use of the work, and the providing or failure to provide warnings or instructions.

- There is an exclusion in the CGL Policy for damage to the **Insured’s Work** which reads as follows:

This insurance does not apply to **Property Damage** to the **Insured’s Work** arising out of it and included in the **Products and Completed Operations Hazard**. This exclusion does not apply if the damaged work or the work out of which the damages arise was performed on the **Insured’s** behalf by a subcontractor.

It is difficult to imagine a set of circumstances where a failure to achieve certification or a promised level of certification would trigger coverage under the contractor’s CGL Policy. In the first place, there is not likely to be any event that meets the definition of “occurrence.” The fact that materials or components do not perform as promised is also unlikely to constitute “property damage” as required by the CGL Policy. Finally, the exclusion for damage to the Insured’s Work will apply to many circumstances that otherwise might be argued to represent a claim against the policy.

Claims may also be filed against contractors for failure of a building to achieve the level of certification required for a tax credit that is anticipated as part of the project economics. Each jurisdiction seems to have its own formula for how these credits are calculated, the time period for which they are effective, and requirements that must be met to qualify for the credits. The loss of a tax credit was part of the damages claimed in the first litigated green building claim to actually reach the courts in the United States. In *Shaw Development v. Southern Builders*,<sup>21</sup> the contractor filed a mechanic’s lien for an unpaid bill of \$54,000. The owner countered with claims against the contractor for \$1.3 million that included \$635,000 for the loss of a tax credit under a state green building program, which was allegedly lost because the building was not completed within a time period specified in the tax program. The contract documents set forth the project’s LEED requirements in a specification section, but there does not appear to be any provision that obligated Southern to secure formal certification from the USGBC. With no provisions that allocated the risk of certification or loss of the tax credit to the contractor, the case was settled out of court with no further investigation of the legal questions raised by the allegations. It also cut off any further inquiry into the possible application of the insurance policies maintained by the contractor to the costs of this claim.

These circumstances or some variation of them are likely to be present in future claims that will define the liability of the contractor for a failure of the owner to obtain tax credits or other green building incentives as a result of a delay in the completion of the project. Under a slightly different fact pattern, a claim for the lost tax credit could also be made against the design professionals involved in the project for failure to deliver or get plans approved in time to meet the requirements of the tax rebate program.

### **Affirmative Grants of Coverage for Green Building Design Activities**

In response to requests for clarification of policy intent, some underwriters have begun to offer endorsements to professional liability insurance policies that

provide affirmative coverage to architects and engineers for their activities related to the design of green buildings, systems and components. An example of this extension of coverage is found in the Zurich Technology Services Endorsement, which addresses both Building Information Management (BIM) and LEED activities of the insured design firm. This endorsement makes the following changes to the Zurich Professional Liability Policy:

1. "Technology Services" is added to the covered areas of "Professional Services."
2. A definition of "Technology Services" is added to the policy. This definition reads as follows:

**Technology Services** means the activities performed by or on behalf of the **Insured** related to **Professional Services** including:

- a. website design or website programming;
  - b. database design or database management, data warehousing, data application hosting;
  - c. hosting, management or maintenance of websites designed or programmed by you;
  - d. maintenance of computer programs, applications or systems designed or developed by you; and
  - e. design and development or use of computer software programs, applications or systems;
  - f. creation, maintenance or use of any digital model or digital representation;
  - g. delivery of services in your capacity as a "LEED Accredited Professional."
3. A new exclusion is added to the policy which reads as follows:

This insurance does not apply to the failure to prevent unauthorized access to or use of an electronic system or program, unless such unauthorized access arises out of a negligent act, error or omission in the rendering of or failure to render **Professional Services** by you.

While this affirmative grant of coverage for LEED activities is of value, it does not afford complete protection to design professionals for a number of significant green building risks. Since the warranty and guarantee exclusion is not altered or deleted, any claim arising out of a promise by the architect to achieve LEED certification

or a specific level of certification will still not be insured. The same would be true of a contractual commitment in a design contract to achieve a specified savings in energy or water use or other improvement in the performance of the building, its systems or materials. In short, the architect is still not assured of protection for promises made to the owner concerning the performance of a green building or that guarantees that a design will achieve LEED certification under this endorsement to the professional liability insurance policy.

The Lexington Insurance Company has produced a specific LEED Endorsement to its Professional Liability Policy that is intended to assure architects and engineers they have protection against claims arising out of their activities in designing green buildings. This endorsement adds the following amendment to the definition of "Professional Services" in the policy for green building services:

**Professional Services** means those services that the **Insured** is legally qualified to perform for others in their capacity as a LEED Accredited Professional.

As with the Zurich form, the Lexington policy, including the LEED Endorsement, does not modify or delete the exclusion for claims related to express warranties or guarantees provided by the Insured. This means that there will be no coverage for claims arising out of promises to achieve certification or a specified level of performance from the components or systems installed in a green building.

The lack of insurance protection for guarantees of performance by architects is leading to a tension among the parties working to develop green building projects. Owners that are paying the additional costs of design, construction and operation want some assurance from the designers and contractors that their performance objectives will be accomplished. Furthermore, owners may risk losing tax credits, favorable loan terms, increased density allowances and other incentives if the buildings fail to achieve certification at specified levels. Forcing architects to commit to achieve certification or to meet specified performance criteria in contracts for professional services is of limited value since most professional firms are rich in people, but not in monetary assets. For serious claims, all parties typically look to the protection in the professional liability policy rather than the assets of the design firms.

Even where affirmative coverage is provided in Errors and Omissions (E&O) policies for green building activities, owners must evaluate other provisions of the policies to determine the level of protection afforded by the insurers. Issues that should be investigated include the following:

1. Adequacy of limits to pay for claims that might result for a failure of the building to achieve LEED

certification or the level of certification sought by the owner.

2. Whether the policy limits have been reduced by claims arising out of work on unrelated projects during the same policy period.
3. Deductibles or self-insured retentions that will apply to losses and the assets available to pay them.
4. Other policy provisions that may impact or limit coverage or deductible for a specific type of claim.
5. The period of coverage for completed operations if the design defect is not discovered until the project has been completed.
6. Other intervening parties or actions that may relieve the design firm of responsibility or liability.

An owner might also be able to obtain additional coverage for green building risks associated with design services by purchasing an Owner's Protective Professional Indemnity (OPPI) Insurance Policy. The owner is the Named Insured in the policy, but it affords protection only for claims arising out of the acts, errors or omissions of design professionals. Underwriters normally require the principal design firms to maintain professional insurance with specified minimum limits (typically from \$1 million to \$3 million). The OPPI Policy provides coverage on an excess and difference in conditions (DIC) basis over the design firm's policy. This means that it will pay where the limits of that policy are exceeded or for claims where the coverage in the OPPI form is broader than that included in the E&O policy scheduled as underlying. It does not provide protection or defense to the architects or engineers. Some of the current versions of these policies do not include exclusions for warranties and guarantees made by the design firms. Owners seeking the protection of an OPPI Policy should consult with a broker to make sure they understand the coverage and limitations included in this type of policy and to make certain that forms such as that discussed above are still available.

### **Claims Against Property Managers Arising Out of Operations**

Owners and tenants may bring claims against property managers for the failure of green buildings to perform as expected. Allegations might be that the actions of the manager had a negative impact on the operation of components or systems resulting in their failure to provide the healthy work environment, energy efficiency, water use reduction or other benefit of a high-performing building. For example, the operator might adjust or fail to maintain the HVAC or energy efficiency equipment in ways that compromise the performance, resulting in higher electric bills and poor interior air quality. If these conditions go uncorrected, they might be the basis for a tort claim against the responsible parties.

As with claims by developers, owners and tenants against contractors, claims against property managers would be submitted to casualty insurers writing commercial general liability and excess liability policies for the property manager. The discussion above would also apply to the claims filed against property managers. Namely, there is not likely to be an "occurrence," the nature of the injury may not meet the definition of "property damage" and exclusions will apply that negate coverage that might otherwise be available.

### **Performance Bonds as a Remedy for Green Building Defects**

A bond is a three-party contract in which a surety guarantees the contractor's promise of performance to the owner. The purchaser pays a premium for the commitment of the surety. A performance bond is written in conjunction with a construction contract and provides assurance to the owner that the contractor will complete the project as specified in the construction agreement. In the event that the contractor defaults under the terms of the contract, the surety must provide a replacement contractor that will finish the work or pay a penalty equal to the face amount of the bond less an amount that equals the payment for work performed prior to the default. Most bonds are triggered by the bankruptcy of the contractor for whom the surety has provided a promise of completion.

Where a replacement contractor is hired to complete the work, the finished project should be exactly the same as it would have been if the original contractor had performed the work. Where the penalty sum is paid in lieu of hiring a substitute contractor, the owner must hire a contractor to finish the work and the terms of a new contract with a new builder may differ from those of the original construction agreement. Neither option guarantees that the building will achieve LEED certification or a specified level of green building certification (i.e., LEED Silver or Five Green Globes, etc.), nor do they guarantee the efficiency of building insulation, HVAC equipment, plumbing fixtures or other mechanical systems to deliver promised levels of performance.

### **Insuring Risks in Completed Green Buildings**

There is another set of risks associated with green buildings that may require specialized risk management attention. This involves the risk of physical damage to the structure and its contents and the risk of liability of the owner for third-party claims arising out of the ownership and operation of the structure.

When green buildings are damaged or destroyed by physical perils, there may be limitations in standard insurance policies that impact the owner's recovery for damages. Typical "All-Risk" insurance policies include insuring agreements that require the insurer to pay the



costs to restore the insured property to the same condition it was in prior to the loss. Replacement cost provisions allow the insured to replace damaged components with new ones of similar kind and quality without deductions for depreciation. Given these conditions, there is a possibility that a policy of this type might allow the parties performing the restoration of damaged property to substitute components that are not exactly the same as those they replace. If the owner is not attentive to the requirements of recommissioning, the new components might not perform at the same level as the original ones, resulting in a change in the points allowed by the rating system.

Physical damage insurance policies are available that assure proper coverage is provided to guarantee that a certified green building damaged by an insured peril will be restored to its former status, including the certification level it had before the loss. Enhancements to standard policies include additional technical assistance required to assure certification is achieved and a commitment that the performance of damaged components is matched or exceeded by the ones that replace them. The business interruption coverage is also enhanced to allow extra time for the additional design services for certification and the commissioning process itself, which may add weeks to the restoration process. The costs of re-certification are also affirmatively included in the covered loss. The same coverage issues can arise during construction of a green building and may be addressed by adding the same coverage enhancements to a builder's risk insurance policy written to cover physical damage risks during the period of construction.

These green building physical damage policies may cost more than similar coverage for conventional buildings, but insurers are discovering that certain characteristics of high-performing structures make them better than average risks. The owners and occupants of green buildings are often among the most careful of insured classes. With better attention to maintenance, the buildings are often superior to their conventional counterparts with respect to risks that are associated with the ownership and occupancy of the insured properties. Green buildings may also be less susceptible to losses resulting from mechanical breakdowns and equipment failures as a result of the upgrades to mechanical systems and the commissioning process that provides a check on the operation of these systems. Increased attention to the maintenance of mechanical systems also helps to prevent breakdowns throughout the lifecycles of the structures.

The ownership and operation of buildings may subject the owner to liability for bodily injury or property damage suffered by tenants, employees or third parties. Insurance for claims against the owner is typically provided by commercial general liability policies similar to those described earlier in this report. These policies respond to claims alleging bodily injury and property dam-

age and pay the costs of defense as well as indemnifying the insured for costs of judgments and settlements which establish liability.

There may be liability risks in green buildings that are different from those in conventional structures. The first is the possibility that the owner of a high-performing building may be held to a different standard of care than the owner of a conventional building. Where energy savings, reduced water consumption, a healthier work environment and enhanced productivity are advertised benefits of these structures, the owner may become liable for areas where the performance fails to meet reasonable expectations of the occupants.

There may also be unique risks that are the result of special features incorporated in green buildings that do not exist in conventional structures. For example, if a green building incorporated a vegetative roof system that captures and recycles rain water for use in landscape irrigation, there may be a risk of water incursion that does not exist in buildings with standard roofing systems. A leak in the roof or recovery system may result in water damage or mold in occupied spaces that is not present in buildings that do not incorporate these advanced sustainability features.

On the other hand, green buildings may pose a lower risk of third-party claims than conventional buildings for a wide variety of risks. Claims arising out of the building environment are much less likely than in conventional structures due to reduced levels of volatile organic compounds and healthier fresh air. Data on green buildings indicate lower rates of illness and absenteeism, especially with regard to respiratory conditions such as asthma and allergies. Insurance companies also believe that owners that spend the additional money for a certified green building are likely to be better risks than other owners due to the attention given to building operations and maintenance. This "halo effect" has resulted in reduced rates on CGL and excess liability insurance policies for green building owners and for tenants that occupy such buildings.

### **Risk Management Measures to Protect Investments in Green Buildings**

Underwriters providing professional liability insurance to architectural firms, as well as those offering general liability coverage to contractors and subcontractors, have been unwilling to modify their policies to provide coverage that will pay in all cases for losses suffered by developers, owners or tenants as a result of failures of green buildings to meet the expectations of interested parties. With the limitations discussed above in mind, it is important for these parties to implement other risk management measures to minimize the need to rely on insurance coverage as a remedy.

The most important factor in achieving the expected results in a green building project is to involve design professionals, contractors and subcontractors that are familiar with the process and have experience with other successfully certified projects. With thousands of LEED accredited professionals, there is no lack of assistance available from architects and engineers when an owner or developer elects to build a high-performing structure. The experience of owners that have gone through this process indicates there is typically a steep learning curve for architects and contractors on their first projects. This results in higher soft and hard costs and may delay completion, especially where documentation is not complete when initially submitted for review. The commissioning process may also be unfamiliar to newcomers and may result in additional delays if it is not coordinated with design and construction schedules.

Another important factor in the successful completion of a certified green construction or retrofit program is the use of an integrated design and construction process. The following steps are recommended to assure a successful project with a minimal amount of unnecessary delay:

**1. Develop and Define Expectations for the Project**

The owner and principal architect should establish a scope of work that includes clearly defined tasks based on the completed project achieving performance standards that are required for green buildings.

**2. Select Qualified Team Members for Building Design**

The owner and principal architect should select other design professionals that have the necessary qualifications and experience to work on a green building project.

**3. Set Goals for the Project and Allocate Responsibility to Achieve Them**

The achievement of the desired level of certification requires a set of goals that assures proper consideration of the necessary factors and allocation of responsibility to the architects and engineers working on the project. The discussion should include collaboration on identification of risks and opportunities with possible impacts on costs and schedules.

**4. Develop Basic Design That Will Achieve Goals**

If the site can be selected, consider the integration of the building and its site. Also consider the occupants' needs with respect to space, transportation, visibility and other factors. If the site is a given, determine the type of structure that can be built to maximize achievement of the goals identified above.

**5. Coordinate the Design of Components and Systems**

The various design professionals should work together to create efficient components and systems that are compatible with each other and contribute to maximize the utility of the building and the health of occupants. Each component should be selected with the goal of certification in mind and the team should meet frequently to review the status of each component and the project as a whole.

**6. Prepare Construction Documents and Specifications**

Drawings and specifications should be prepared that reflect the coordinated efforts of the design team and the goals of the owner. Specifications should state performance objectives so contractors will understand the goals established at the outset by the owner and the design professionals. Sustainable building materials that will be used in the building should also be clearly described along with requirements for performance.

**7. Select Qualified Short List of Contractors and Release Bid Packages**

Successful results depend on the ability of the contractor to execute the plans of the design team. A list of contractors with experience in successful green building projects should be selected to receive requests for proposals. This will eliminate the requirement for on-the-job learning that can translate to mistakes and additional costs. Bid packages should be released with clear instructions regarding the goals to achieve a high-performance structure.

**8. Review Proposals and Award Contract**

The entire team of design professionals should be involved with the owner in the process of selecting the contractor to execute their green building design. Proposed subcontractors should also be reviewed to make certain they are aware of and commit to meet project goals. Risk issues should also be discussed to maximize the use of coordinated safety and insurance programs that apply to all parties providing services related to the project.

**9. Prepare and Execute a Contract That Reflects Project Objectives**

The construction contract should specify the expectations of the owner and the design professionals with respect to certification and the performance of various components and systems. It should also identify the building elements and specify that they have been designed and selected with consideration of their relationship to each other so the contractor understands the signifi-

cance of substitutions and deviations from the specifications.

#### **10. Determine Responsibility for Documentation and Certification**

The responsibility for preparation and submission of the documents required for certification should be assigned. This may be done by the architect, the contractor, a construction manager or by a third party hired specifically to assist in the process of certifying the building. Cooperation of all parties is essential to assure complete and accurate information is available for the certifying party. The selection of responsible parties may depend on the complexity of the project, the experience of the individuals and entities, and the cost of professional services.

#### **11. Supervise and Review the Construction Process**

Every aspect of the construction should be supervised to make certain that the execution follows the plans and specifications and that all goals of the owner and design professionals are realized. Deviations should be corrected. Where change orders are required, they should be approved by the owner and the design team to assure they do not negatively impact the certification or compromise the performance objectives.

#### **12. Complete Commissioning**

Engage third party commissioner to complete the review of the documentation and to certify the performance of the completed building. Make certain that all design firms are available to answer questions that may arise during the commissioning process.

#### **13. Develop Operating Manual and Instructions**

Certification is the beginning and not the end of the process. All savings generated from green buildings are derived during its lifecycle and depend on proper operation and maintenance of high-performing components and systems. With more complex equipment and carefully selected materials, it is important that those responsible for operation of the building are aware of their role in achieving the goals of the owner and design professionals. Comprehensive manuals should be maintained for the operation and maintenance of equipment. Sets of specifications should be prepared and retained for interior-finish materials and building-provided furniture.

#### **14. Maintain Records to Document Performance**

The ultimate goal of owning a green building is its performance over its operating life. All aspects of its performance should be documented to make certain it remains in compliance with any requirements of lenders, tenants and regulators. These

records should also document that any repairs and replacements of equipment do not affect performance or jeopardize certification.

### **Conclusions and Recommendations**

Green buildings are more than a passing fad. They are an essential part of any program to reduce emissions of greenhouse gases and to lower dependence on fossil fuels. They are also an important component of sustainability efforts that will reduce the consumption of non-renewable resources and allow reuse of materials at the end of building lifecycles. The useful life of structures can be extended by the flexibility in interior space planning, superior building materials and performance characteristics of green buildings.<sup>22</sup> High-performing structures create healthy environments in which productivity is maximized and factors that negatively impact the health of occupants are reduced. All of these benefits can be accomplished with a minimal initial investment that is paid back in a relatively short period of occupancy.

New insurance products have been developed to allow replacement costs for preexisting green features and to maintain green certification. Coverage may be provided to rebuild after a loss with green materials which would include related consulting and architectural costs. Coverage is available for extra costs associated with green removal, disposal and recycling. Business interruption loss may include the increased time associated with complying with being green. Insurers are also offering discounts on insurance premiums for being green.

There are risks associated with the design, construction and operation of green buildings, some of which cannot be insured by available professional and general liability insurance policies. Over time insurance policies may be improved to address some areas that are not currently insured, but prudent design professionals, building owners and tenants also should rely on good risk management practices to prevent liability. In designing and constructing green buildings, the most important factors in minimizing risks of loss include the use of an integrated design and construction process that focuses on the common goals of the parties and the processes that assure these goals are achieved. Well-written contracts are also important to assure the achievement of specified performance objectives. Architects, engineers and contractors with a successful record of completing certified green buildings are more likely to be successful in achieving performance objectives at a lower initial cost.

New insurance policies and enhancements to existing forms will allow all parties involved in the green building movement to pursue their goals with less concern about risks that are peculiar to high-performing structures. Until the insurance catches up with sustainability practices, other risk management techniques will remain an important part of this growing industry.



## Endnotes

1. Buildings and Climate Change, Status, Challenges and Opportunities, United Nations Environmental Programme Publication, 2007. In the United States the number is even higher, with building construction and operations accounting for more than 13% of GNP.
2. *Id.*
3. Building Impacts, United States Green Building Council Publication, 2007 and 2008.
4. Building Momentum, National Trends and Prospects for High-Performance Green Buildings, U.S. Green Building Council, February, 2003.
5. Ashley Katz, Green Building Returns Outweigh Costs, June 26, 2008. *See also* Gregory Kats, Green Building Costs and Financial Benefits.
6. Energy Efficiency in Buildings, Business Realities and Opportunities, World Business Council for Sustainable Development.
7. LEED stands for Leadership in Energy and Environmental Design, the certification program sponsored by the United States Green Building Council.
8. Australia has green building programs known as Nabers and Green Start, Canada uses Green Globes, China has GBAS, Finland utilizes PromisE. The green building system in France is known as HQE, while Germany uses BGNB. In Hong Kong a program known as HKBEEM is utilized; while in Italy, the program is known as Protocollo Itaca. Netherlands and the United Kingdom use BREEAM. Portugal has a system called Lider A, while Singapore has Green Mark. Spain's green building program is known as VERDE.
9. Buildings and Climate Change, Status, Challenges and Opportunities, United Nations Environmental Programme Publication, 2007.
10. CFCs are any of several organic compounds of carbon, fluorine, chlorine and hydrogen; manufactured under the trade name "Freon." Due to a growing concern over stratospheric ozone depletion, a ban was imposed on the use of CFCs in aerosol-spray dispensers in the late 1970s.
11. The Energy Star Program was developed in 1992 by the U.S. Environmental Protection Agency in an attempt to reduce energy consumption and emissions of greenhouse gases by power plants. In the years since, it has expanded to become an international standard for energy efficient consumer products and buildings. Energy Star equipment and appliances demonstrate energy savings of 20% to 30% over non-certified devices.
12. Norman Miller, Jay Spivey and Andy Florance, Does Green Pay Off?, February 5, 2008.
13. Greg Kats, The Costs and Financial Benefits of Green Buildings, A Report to California's Sustainable Building Task Force October, 2003.
14. States that have already adopted or are considering mandatory green building statutes include Arizona, Arkansas, California, Colorado, Connecticut, Illinois, Maine, Maryland, Massachusetts, Michigan, Missouri, Nevada, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Washington and Wisconsin.

Counties that have enacted green building statutes requiring public buildings to be certified include Arlington County, VA, Cook County, IL, Dane County, WI, and King County, WA.

Cities that require certification for public buildings include Austin, TX, Boulder, CO, Chula Vista, CA, Chicago, IL, Eugene, OR, Frisco, TX, Kansas City, MO, Los Angeles, CA, New York, NY, Portland, OR, San Diego, CA, San Jose, CA, San Francisco, CA, Santa Monica, CA, San Mateo, CA, Scottsdale, AZ and Seattle, WA.

In total, there are more than 90 state, county and local regulations that require developers to build new structures to meet LEED certification standards. Many of these regulations also require the same for renovation projects where more than some established amount of money is being spent.

15. The Dollars and Sense of Green Retrofits by Deloitte and Charles Lockwood included the results of a survey that indicated factors for undertaking a green retrofit on an existing building.
16. Energy Efficiency in Buildings, Facts & Trends, World Business Council for Sustainable Development, July, 2008.
17. *Id.*
18. The baseline is calculated using the energy cost budget and performance requirements in the ASHRAE 90.1 standard.
19. Lexington Insurance Company Designers & Agency Construction Managers Professional Liability Insurance for a Specified Project, Form LEX-CM-PLS (Ed. 02/04).
20. Liberty International Underwriters Commercial General Liability Insurance Policy (form CGL 04.06).
21. The *Shaw* case arose out the construction of a \$7.5 million condominium project in Crisfield, Maryland. The complaint was filed in a Maryland Circuit Court in 2007.
22. Greg Kats, The Costs and Financial Benefits of Green Buildings, A Report to California's Sustainable Building Task Force, October, 2003, citing a study by the Packard Foundation that reports lifecycles of 40 years for conventional structures, compared to 60 years for LEED Silver building and up to 80 years for a LEED Gold or Platinum building.

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# Solar Power & NYC Schools: Good Government and Electric Sparkplug

By Robert DeLay

The role of electricity in contemporary society is increasingly important and supplying it reliably and economically is crucial to the economy. . . . The State must ensure adequate generating capacity and distribution capacity necessary to avoid constrained areas . . . while simultaneously protecting the State's environment and reducing global warming. New York needs to maximize the benefits of fuel diversity, energy efficiency, renewable energy, new technologies and energy security, while strengthening the State's economy.<sup>1</sup>

## I. Introduction

By 2030, the New York City Department of City Planning estimates 1.1 million more people will live in New York City.<sup>2</sup> On summer days, when electrical consumption peaks, New York City already consumes more power than Chile and almost as much as Switzerland.<sup>3</sup> Demand, however, continues to grow: New York City Mayor Michael Bloomberg's Plan 2030 ("NYC Plan 2030") estimates that electrical demand will increase by 25% from just over 9 gigawatts ("GW"), or 9,000 megawatts ("MW"), to over 11.5 GW (11,500 MW),<sup>4</sup> with demand overtaking supply in 2011.<sup>5</sup> Con Edison ("Con Ed"), New York City's main electrical supplier, expects more than one million more room air conditioners in the city in the next five years.<sup>6</sup> City advocates have noted that "as energy demand rises, so does our reliance on dirty, inefficient power plants."<sup>7</sup> NYC Plan 2030 notes that "with limited land available to build new power plants, our challenge is to find a new approach to improve the City's long-term energy outlook."<sup>8</sup> Under current projections, this increased power supply will come mostly in the form of additional natural gas and petroleum with only a small percent increase in overall renewable energy supply.<sup>9</sup> Simple economic theory holds that as demand increases relative to supply, prices will rise.

Further, in addition to the expected rise in petroleum demand caused by the growth of Chinese and Indian economic markets, experts are deeply concerned about the future availability of domestic natural gas.<sup>10</sup> Even without these concerns, natural gas is imported from other states, giving them the benefits of job creation and tax revenue.<sup>11</sup> Finally, because of its environmental and health impact—and NYC Plan 2030's goal of making the city's air the cleanest of any big city in the U.S.<sup>12</sup>—the city is unlikely to greatly increase coal consumption.

New York City ("NYC") is, thus, faced with a seemingly impossible set of choices regarding its continued economic growth, environmental sustainability goals, and position as "capital of the world." The approaching en-

ergy predicament, however, actually presents NYC with the opportunity to reexamine its energy policy in light of these upcoming problems.<sup>13</sup> The best, and possibly only, solution is to encourage the large-scale use of renewable sources of energy. Although government purchase of renewables can help relieve some of the energy pressure NYC faces, the great majority of electrical demand comes from the private sector. Government investment in renewable energy, however, can help stimulate the market for renewable energies in the private sector.

## II. Potential Renewable Energy Sources

Wind energy has great potential in New York State;<sup>14</sup> it does not, however, have the same potential in NYC. There are not enough open spaces and the land is low in altitude, both of which disqualify the city for large-scale wind development.<sup>15</sup> Staten Island, for instance, "is investigating the feasibility of installing at least five windmill towers atop the closed landfill's tallest mound."<sup>16</sup> This could, potentially, provide electricity for 5,000 Staten Island homes.<sup>17</sup> There are not, however, many other spots around NYC that match this potential. Further, while powering 5,000 homes without burning fossil fuels is beneficial, clearly wind could not meet the current or future electrical demands of NYC. Finally, as the recent attempt to install wind turbines in Cape Cod illustrated,<sup>18</sup> many residents do not want wind turbines to potentially impede their views, no matter what the benefits—and they will fight to prevent their installation.

Another renewable energy source for NYC is wave, or tidal, power. In 2006, Verdant Power—a tidal-turbine developer—installed the first series of tidal-turbines in NYC's East River.<sup>19</sup> According to the company, the East River has the potential to create 10 MW of electricity, or enough to power roughly 8,000 homes.<sup>20</sup> Even if the Hudson River had the potential to double the overall impact, it would still be only a fraction of NYC's demand.<sup>21</sup> Further, it is only a fraction of the potential of solar energy in NYC.

Solar power is the only renewable energy with the potential to solve NYC's energy problems.<sup>22</sup> If NYC installs photovoltaic solar panels ("PV") on the roofs of New York City schools—the largest group, in number and size, of publicly-owned buildings in the city—it could provide approximately 120 MW of electricity, or enough electricity to power 120,000 NYC homes.<sup>23</sup> While the costs of this system appear enormous, the investment could be repaid in approximately a decade; it could also be paid without using any tax revenue. Most importantly, this large-scale investment will also spur private PV installa-

tion in the city through the economies of scale, which will lower the costs of parts and installation. This plan could markedly decrease the demand for nonrenewable sources of energy, stabilize electrical prices citywide, lessen the risk of citywide blackouts by decentralizing the electrical grid, provide power during peak-demand times and stimulate job-growth.

### III. Electrical Demand in NYC: Present and Future

According to a report by New York City Councilman Eric Gioia, “New York City residents are already paying significantly higher utility bills” than residents of other large American cities.<sup>24</sup> In January 2007, NYC residents paid nearly \$0.19 per kilowatt-hour (“kWh”);<sup>25</sup> the national average for electricity was about \$0.10/kWh.<sup>26</sup> In fact, according to Councilman Gioia, San Francisco residents—in the midst of California’s energy crisis of the past seven years—were still paying \$0.04/kWh less than New York City residents.<sup>27</sup> At the same time, Con Ed has already applied for a rate hike in 2008.<sup>28</sup> According to the company “[t]he city is projecting significant growth in its population, housing stock, and commercial development over the next several years. The growth will create new energy needs, which must be addressed with billions of dollars in investment to enhance and expand our electric delivery system.”<sup>29</sup>

It is clear that increased energy supply, competitive electrical prices and environmental and land use concerns cannot be addressed under the current methods of energy production. The current situation highlights the extreme supply and demand pressure NYC is under. The study implicitly shows how San Francisco’s (and California’s, in general) pro-active planning—as discussed below—in favor of renewable energy and energy efficiency might have begun to reduce demand from power plants. What have New York’s state and local governments done to reverse our unsustainable course?

#### A. New York State Legislation

Executive Order 111 of then-New York State Governor George Pataki notes the responsibility of the State to assume “a leadership role in promoting the efficient use of energy and natural resources in the interest of the long-term protection and enhancement of our environment, our economy, and the health of our children and future generations.”<sup>30</sup> The Order demands energy efficiency measures be taken immediately on all new and existing buildings owned by the State.<sup>31</sup> The Order also forces state agencies to increase their purchase, from 10% in 2005 to 20% in 2010, of energy from renewable sources such as PV.<sup>32</sup>

Former NY Governor Eliot Spitzer has stated, “we face three seemingly intractable challenges: rising energy bills, rising global temperatures, and a rising tide of young people leaving (NY) for opportunity elsewhere—

each of which can be addressed by a long-term clean energy strategy.”<sup>33</sup> Although the speech does not mention PV, the former governor noted that, “the cheapest and cleanest power plant in the world is the one you never have to build.”<sup>34</sup> The plan, however, calls exclusively for renewable energy investment in Upstate NY.<sup>35</sup> It also focuses almost exclusively on energy efficiency measures, without detailing plans for renewable energy production. The former governor misses one of the key findings of NYC Plan 2030: higher population and more reliance on technology, whether efficient or not, will increase demand. Further, Upstate investment in renewables will not sufficiently address energy demand in NYC.

#### B. New York City Legislation

The government of the City of New York (“the City”) has taken even stronger steps, most notably Local Law No. 86/2005 (“LL 86”).<sup>36</sup> LL 86 notes “probably no urban activity has greater impact on human health and the environment than building construction and use.”<sup>37</sup> In fact, according to NYC Plan 2030, 79% of NYC’s CO<sub>2</sub> emissions came from buildings.<sup>38</sup> LL 86 notes that most of NYC’s electricity is produced within the city; increased use further harms the local environment.<sup>39</sup> The growth in demand, it states, increases “our reliance on dirty, inefficient power plants.”<sup>40</sup> As the first step toward remedying this situation, the law recognizes that green-building techniques reduce the demand for energy;<sup>41</sup> therefore, green methods of building construction and use are a “sound investment of public dollars.”<sup>42</sup> Finally, the financial analysis done by the NYC Council demonstrates that avoided costs, besides the additional benefits noted earlier, will “offset debt services.”<sup>43</sup> This presumed offset concurs with San Francisco’s experience in PV installation at its Mascone Convention Center, discussed below.<sup>44</sup>

In 2005, the New York City Council also produced a report entitled “Working Towards A Sustainable City: Accomplishments & Agenda,” which outlined past legislation and future goals of the City regarding sustainability.<sup>45</sup> Although it correctly points out that “New York is already a very environmental city (because of its) incredible density and extensive public transportation system,”<sup>46</sup> the report also notes that “if the City is to maintain its position as a global leader and improve the health and quality of life of those who live and work here, it must further reduce its ecological footprint.”<sup>47</sup> The report highlights that “as the cultural, media and financial capital of the world, and with a \$50 billion budget, if we lead the way towards environmental sustainability, many others will take notice.”<sup>48</sup> Finally, it states, “as the consumer of over 10% of the energy used in this city, the operations of the City of New York have a major impact on local energy availability and air pollution.”<sup>49</sup>

In the Climate Protection Act of 2005, the City passed a law requiring the Office of Environmental Coordination to inventory the City’s emissions and produce an action



plan to reduce its emissions.<sup>50</sup> From a baseline of 1995 emissions, the bill requires the City to reduce emission by 20% by 2010, 25% by 2016 and 30% by 2021.<sup>51</sup> The City, however, has not finalized the data, nor has the City developed or implemented the plan, or monitored progress and reporting results.

Most recently, in an attempt to reduce the energy demand from new NYC buildings, Mayor Bloomberg announced the first major overhaul in the NYC building code since 1968.<sup>52</sup> The new standards emphasize “efficiency and sustainability.”<sup>53</sup> For the first time, the city’s building code will be tied to the national three-year revision cycle, “enabling the city to take advantages of innovations in new materials and technology.”<sup>54</sup> The updated code will provide rebates for “green design” and will require “more efficient heating and cooling systems, white roofs, and (encourage) plumbing systems that conserve water.”<sup>55</sup>

The legislation undertaken by New York’s state and city governments illustrates their recognition of the economic waste in current energy production and use, the cost-saving potential of green energy production, and other societal costs of the status quo. NYC Plan 2030 similarly illustrates NYC’s recognition and concern.<sup>56</sup> NYC is trying to balance population and economic growth with these unavoidable energy concerns: how can NYC grow by one million residents in 25 years without destroying our air and economy? With energy demand sure to grow, how can we hope to improve our air and avoid extreme spikes in energy costs? In a city already almost completely developed, from where will we produce this extra electricity?

#### **IV. Consequences of Current Electricity Production and Use**

Our current production of electricity severely affects all aspects of life in NYC. Individuals, families, and businesses, as well as land, are all affected by the power plants that supply NYC with its electrical demands. Some of the consequences include abnormally high asthma rates and some of the highest electrical prices in the nation.<sup>57</sup>

As NYC Plan 2030 notes, in 2000, asthma hospitalization rates for children in NYC were almost twice the national average.<sup>58</sup> The New York City Economic Development Corporation further estimates electrical demand will increase by 25% by 2030.<sup>59</sup> This will significantly harm our already precarious environmental situation. New York City is already out of compliance with national standards in ozone levels and small particles.<sup>60</sup> Its asthma hospitalization rate is twice the national average; in the Bronx, the rate is almost four times the national average.<sup>61</sup> Currently, in fact, power plant emissions contribute to over 1,000 deaths and 25,000 asthma attacks in the metropolitan area.<sup>62</sup> These emissions cost the city over \$6 billion *every year* in public health related expenses.<sup>63</sup> According

to the NYC Apollo Alliance,<sup>64</sup> “[t]he poor air quality and high rates of asthma in the city as a whole most severely affect children in low-income communities of color, which are often home to new power plants built to keep up with the city’s energy appetite.”<sup>65</sup> As NYC Plan 2030 notes, “reducing emissions from local sources alone could dramatically improve air quality.”<sup>66</sup> Unfortunately, emissions have actually increased from the City’s largest generators: “the Ravenswood plant in Queens increased its NO<sub>x</sub> and SO<sub>2</sub> emission by 14%, respectively, between 1995 and 2003. . . . The Astoria generating plant increased its SO<sub>2</sub> emissions by 65% during the same period.”<sup>67</sup> Note that both of these power plants are located in poor, predominantly minority-inhabited sections of Queens.

Beyond environmental consequences, the economic landscape looks even worse. As stated, NYC electrical demand is scheduled to increase 25% by 2030 with demand overtaking supply in 2011.<sup>68</sup> Global warming will spur some of this increased demand. As a result of rising temperatures, the number of days in which the city will need air conditioning will increase by 43% to 135% during the 21<sup>st</sup> century.<sup>69</sup> The limited supply of land for new power plants, together with increasing demand, will cause prices to skyrocket.<sup>70</sup> NYC’s energy infrastructure is “aging and increasingly inefficient.”<sup>71</sup> According to combined data from the NYC Economic Development Corporation and the Mayor’s Office of Long-term Planning and Sustainability, the percent of energy from power plants over 50 years old will increase from 5% to 70% by 2030.<sup>72</sup> This is especially problematic: plants in operation for more than 30 years require over 10,000 BTUs to produce 1 kWh, whereas plants in operation less than 30 years require only 7,000 BTUs—53% less.<sup>73</sup> Thus, by 2030, our current power plants will require *much* more fuel simply to reach current levels of production.

Finally, on March 10, 2005, the EPA issued the Clean Air Interstate Rule (“CAIR”).<sup>74</sup> According to the EPA, CAIR “will achieve the largest reduction in air pollution in more than a decade . . . [it] will permanently cap emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) in the eastern United States.”<sup>75</sup> According to the EPA, this will reduce NO<sub>x</sub> and SO<sub>2</sub> in New York City by 47% and 84%, respectively.<sup>76</sup> While this will help improve our air quality, according to The Center for Sustainable Energy at Bronx Community College, implementation will “increase the costs of fossil-fueled electricity sited within New York City.”<sup>77</sup> With demand set to overtake supply in 2011—and costs sure to rise because of it—how will residents or businesses afford to live and work here? What alternative paths can the City take to avoid this economic and environmental meltdown? The best path would include the installation of large-scale PV systems throughout NYC.

#### **V. Photovoltaic Energy**

According to the U.S. Department of Energy, the PV process consists of light shining on a PV cell; then:

[t]he energy of the absorbed light is transferred to electrons in the atoms of the PV cell. . . . These electrons escape from their normal positions in the atoms of the semiconductor PV material and become part of the electrical flow, or current, in an electrical circuit. A special electrical property of the PV cell—what we call a “built-in electric field” provides the force, or voltage, needed to drive the current through an external “load,” such as a light bulb.<sup>78</sup>

Individual PV cells are connected to form modules, which are in turn connected to form arrays.<sup>79</sup> Together with the PV arrays, a system also includes an inverter, which inverts the electricity from DC (“direct current”) to AC (“alternating current”) power, which is used in most homes.<sup>80</sup> Finally, there is typically a mounting structure to point the arrays towards the sun for maximum exposure.<sup>81</sup>

PV systems are “mobile, silent, durable, virtually maintenance-free, modular . . . and easy to install;”<sup>82</sup> they also typically come with a standard 25-year warranty.<sup>83</sup> PV systems are so reliable, in fact, that they are used on “all space satellites, the Mars Rover, and about 99% of all off-shore Coast Guard buoys.”<sup>84</sup> According to Vote Solar, a California non-profit whose goal is to “build the economies of scale necessary to bring down solar’s cost,”<sup>85</sup> a system installed in Massachusetts in 1981 is still, as of early 2007, operating at 92% of its peak capacity.<sup>86</sup>

PV can save money in two ways. First, any electricity produced by a PV system is electricity that does not have to be purchased from an electric utility; this decreases the amount of supply demanded, and, thus, lowers the overall price.<sup>87</sup> Second, when the PV is interconnected with the existing grid, a PV owner can sell their excess supply back to their electricity provider,<sup>88</sup> a process known as “net metering.”<sup>89</sup> However, according to David Engle, a writer specializing in construction, “[e]lectric utilities—having almost no incentive to make the process easy, and several reasons to thwart it—have typically forced developers to run a gauntlet of expenses and vexing hurdles.”<sup>90</sup> Electric utilities profit per watt of electricity they produce; they have an incentive to make interconnection as inefficient as possible to avoid large-scale interconnection, such as citywide investment in PV.<sup>91</sup>

Recently, however, the New York State Public Service Commission, which is in charge of utilities in the state, made an historic announcement: utilities would be required to “decouple” production from profit-making.<sup>92</sup> As Commission Chairwoman Patricia Acampora noted:

To the extent current design of utility delivery rates continue to link the recovery of utility fixed costs, including profits, to the volume of actual sales, disincentives

exist that limit the utilities’ interest in promoting efficient energy use. Creating a mechanism to reduce or eliminate the dependence of utilities’ revenues on sales, would thereby increase the utilities’ interest in the promotion of customer initiated more efficient energy use.<sup>93</sup>

This change will hopefully encourage utilities to standardize interconnection procedures, while also removing unnecessary rules meant to discourage interconnection.

## VI. Examples of Government Investment in PV

Governments throughout the world have recognized the potential of solar power to meet energy needs. Japan, recognizing future land use and environmental issues similar to NYC’s, introduced subsidies for PV installation in 1994.<sup>94</sup> The program paid 50 percent of the cost of every solar installation.<sup>95</sup> By 2005, the government paid only 3 percent. Because of the economics of scale, PV costs have approached market prices for conventional electricity production and the subsidies have been phased out.<sup>96</sup>

In 2000, Germany passed the Renewable Energies Law.<sup>97</sup> According to Deutsche-Well, a publicly-owned and operated news station similar to the BBC or PBS, “[t]he legislation committed the country to at least doubling the percentage of renewable energy in the overall supply by 2010. It set up generous rates for renewable energy providers who feed into the electricity grid, and created a market for solar energy.”<sup>98</sup> In 1999, 16.5 MW of PV were installed;<sup>99</sup> in 2000, 44 MW were installed<sup>100</sup>—more than twice the previous year.

In 2004, Germany introduced a feed-in tariff. Feed-in tariffs are the amount utilities must pay PV owners for the electricity their system produces and sends back to the electrical grid; in other words, excess electricity above the owner’s current demand. Over a 20-year period, the tariff “permits customers to receive preferential tariffs for solar generated electricity depending on the nature and size of the installation.”<sup>101</sup> The base level of compensation can be up to 45.7-euro cents/kWh.<sup>102</sup> Each year, the tariff will be reduced by 5%.<sup>103</sup> With this additional incentive, in 2005, 845 MW of PV were installed.<sup>104</sup> This growth equates to business expansion for PV companies as well. In April 2007, Goldman Sachs & Co. issued a “buy” recommendation on Centrosolar AG, a German provider of PV systems.<sup>105</sup> The PV market also has brought back economically depressed areas of Germany. “One of the main benefactors of the solar boom is eastern Germany, which has long been under an economic shadow.”<sup>106</sup> In fact, according to the Munich-based consulting firm Roland Berger, by 2020, more people in Germany could be employed in solar and related jobs than are in the auto industry and engineering.<sup>107</sup>

Domestically, in 2003, “New Mexico passed a \$20 million bond for solar and energy efficiency technologies for

state-owned buildings.”<sup>108</sup> Vote Solar expects the project to net \$18 million in savings over the life of the bond period<sup>109</sup>—a 90% return on the initial investment.

In 2001, residents of San Francisco, “after rolling blackouts and soaring energy prices,”<sup>110</sup> voted in favor of a \$100 million bond to fund solar generation for public buildings.<sup>111</sup> The first public building to receive funds under the bond was the Moscone Convention Center.<sup>112</sup> According to Vote Solar, “the measure will pay for itself entirely from energy savings at no cost to taxpayers.”<sup>113</sup> The 675-kilowatt (“kW”) system cost \$5.7 million (after \$2.4 million in state solar and energy efficiency subsidies).<sup>114</sup> It is projected to produce \$750,000 in annual savings, thus recouping the bond money in 7½ years.<sup>115</sup> According to Vote Solar, data from the first year of operation showed the system was delivering savings *above* the guaranteed levels,<sup>116</sup> meaning it could be paid off even faster. The project is also guaranteed to save at least 5,000 MW of electricity over the life of the system.<sup>117</sup>

## A. California Solar Initiative

Perhaps the world’s most ambitious government, however, is the State of California. In August of 2006, Governor Schwarzenegger “signed into law Senate Bill 1, which directs the California Public Utilities Commission (“CPUC”) to implement the California Solar Initiative.”<sup>118</sup> This program, more commonly known as the “Million Solar Roofs Program,” sets a goal of 3,000 MW of new PV capacity in the state by 2017.<sup>119</sup> CPUC will provide \$2 billion in incentives from 2007-2017;<sup>120</sup> the California Energy Commission will manage a \$350 million program to encourage solar in new home construction.<sup>121</sup>

The California Solar Initiative Handbook (“Handbook”) provides the rules and regulations for the plan.<sup>122</sup> The first incentive is the one-time Expected Performance Based Buydown (“EPBB”).<sup>123</sup> According to the Handbook, “these EPBB incentives are based on an estimate of the system’s future performance. [They] combine the benefits of rewarding performance with the administrative simplicity of a one-time incentive paid at the time of project completion.”<sup>124</sup> The EPBB provides a \$2.50 per watt subsidy for systems up to 1 MW with a gradually lower subsidy as the system moves higher above 100 MW.<sup>125</sup> The Handbook states “expected production of electricity by the system may not exceed the actual energy consumed during the previous 12 months at the Site.”<sup>126</sup> Further, all systems also must have a minimum 10-year warranty from the manufacturer and installer.<sup>127</sup> The system must be interconnected to the electrical distribution grid; therefore, it must comply with applicable codes and utility interconnection requirements.<sup>128</sup> The Handbook states “these EPBB incentives are based on an estimate of the system’s future performance. [They] combine the benefits of rewarding performance with the administrative simplicity of a one-time incentive paid at the time of project completion.”<sup>129</sup> All government buildings that fit

within the requirements are eligible for all subsidies and incentives.<sup>130</sup> In fact, government and non-profit PV projects receive \$3.25 per watt (compared to \$2.50 per watt for commercial projects).<sup>131</sup>

After the EPBB, the state also provides a Performance-Based Incentive (“PBI”) to all systems equal to or greater than 100 kW.<sup>132</sup> The PBI is paid per kWh: for residentially- and commercially-owned systems, the rate is \$0.39; for government and non-profit systems, the incentive is \$0.50.<sup>133</sup> The PBI is paid monthly for five years at a constant rate for the entire term.<sup>134</sup> With both the EPBB and the PBI, the state gives government entities an even stronger incentive to implement solar projects. Finally, the process takes between 12-18 months depending on size and type of project (retrofit or new construction).<sup>135</sup>

As stated, the California Solar Initiative is arguably the world’s most ambitious solar development plan. The state recognized the need for reliable, affordable, and environmentally sound energy.<sup>136</sup> To do this, the state put in place “specific and measurable actions throughout California’s energy sector.”<sup>137</sup> Notable for future government-spurred solar projects, this included strong incentives, both upfront and during the life of the system. As stated, California’s goal is to install 3,000 MW of PV systems by 2016. Vote Solar estimates this will result in over 10,000 MW of PV systems installed by 2026.<sup>138</sup>

The 25-year expected Net Present Value illustrates the incredible cost-saving benefit to California’s economy—only one of the various benefits of the initiative. Using Vote Solar’s analysis, avoided costs are examined under three cases: low, medium, and high.<sup>139</sup> Under the three cases, benefits of 25 years of electrical production only from solar installed from 2006-2016 are: \$1.2 billion, \$3.1 billion, and \$5.2 billion, respectively.<sup>140</sup> However, when you include solar systems installed from 2017-2031, the avoided costs over the same 25-year period increase to an astounding \$7.3 billion, \$12.5 billion, and \$18.2 billion, respectively.<sup>141</sup>

Under the low scenario, this program is still a 50% return on investment.<sup>142</sup> Under the medium scenario, the return on investment is 129%; under the high scenario, return on investment is 217%. When you include systems installed from 2017-2031, the return on investment is off the charts. Under the low scenario, the return is 304%; under the medium scenario, return is 521%; under the high scenario, return is 758%. Note, too, the low scenario is highly unlikely; the price assumption for the low model is \$0.11/kWh for peak power generation and \$0.06/kWh for non-peak generation.<sup>143</sup> In 2005, overall residential electricity cost almost \$0.13/kWh (with commercial prices at nearly \$0.14/kWh).<sup>144</sup> Considering residential electric prices have risen every year since 1980,<sup>145</sup> it is unlikely the price will decrease, and remain there, over the next 25 years. The avoided costs, therefore, likely will be closer to the medium or high scenarios, with return on investment



being somewhere between 129% and 217% for 2006-2016 systems and 521% and 758% when you include 2017-2031 systems.

None of these avoided costs include other, positive effects of the plan. Vote Solar estimates approximately 20,000 jobs will be created from the 2006-2016 PV installations alone—those projections increase to over 68,000 jobs including PV systems installed between from 2017-2026.<sup>146</sup> The plan avoids 52 million tons of carbon dioxide emissions, which increases to 188 million tons of emissions avoided over the longer period.<sup>147</sup> These numbers do not reflect other benefits, such as lower incidence of asthma, cleaner air, increased grid reliability, or less volatile energy prices. Overall, these avoided costs and related benefits show that other figures besides upfront installation costs should be factored into price comparisons between competing energy choices. Since 1994, for instance, the National Park Service has factored carbon dioxide, nitrous dioxide and sulfur dioxide to all facility life cycle cost calculations.<sup>148</sup>

## **B. Existing Tax Incentives**

Tax incentives are available from the federal and state government. These incentives are meant to encourage solar installation, which will build the PV industry, thus, affecting the economies of scale; ultimately, this is meant to bring the market price to fossil fuel levels.

The federal government offers a 30% incentive for solar installation.<sup>149</sup> For home installations, however, the credit is capped at \$2,000,<sup>150</sup> while there is no cap for businesses installing PV.<sup>151</sup> Therefore, any system that costs more than \$6,667 would still only receive the \$2,000. This credit is not enough to encourage homeowners to install a PV system: in New York State, a 2.5kW system costs approximately \$22,000.<sup>152</sup> Capping home installations also does not make sense because many small installations on homes can help families reduce electrical costs and demand, while also helping the market attain the economies of scale faster than businesses can.

Some states have picked up the tax incentive slack from the federal government. New York State's "Energy \$mart" program, for instance, provides incentives for systems up to 50kW, that can offset installation costs by 40-70%.<sup>153</sup> The same \$22,000 2.5kW PV system would receive a \$10,000 incentive from Energy \$mart<sup>154</sup> on top of the \$2,000 federal tax credit. The price after both of these credits would be approximately \$10,000, which, assuming a \$100 per month electric bill, would help consumers pay off the PV system in about 13 years.<sup>155</sup> That estimate, however, does not include the higher electrical prices sure to come alongside the increased demand pressures. If the probable increased prices were factored into a 30-year cost analysis, consumers would find their repayment period to be less than the current estimates. The costs of the system noted above, therefore, will most likely be re-

couped in less than 13 years.<sup>156</sup> Residents in San Francisco have already seen how increased rates lead to higher savings. According to Mike Hall of Borrego Solar, a San Francisco PV installer, "everybody who got solar put in last year is saving 11 percent more this year because of rate increases. And rates are going to keep going up. The energy situation is really bad, so it's only a question of how fast (rates go up)."<sup>157</sup>

Banks also recognize how PV installations are smart investments for homeowners. According to ICF, a global energy consulting firm, every \$1 reduction in annual energy costs increases a home's value by \$20.73.<sup>158</sup> Further, a "California property, with a \$22,412 solar system, would be worth \$21,000 to \$49,000 more."<sup>159</sup> According to Mr. Hall, "homeowners usually have no problem getting home-equity loans for solar systems. 'Depending on what type of loan you can get, you can make it so that your loan payment is about the same as what you would have paid (your utility company). So when rates go up again you're doing even better.'"<sup>160</sup> PV systems increase the worth of homes and buildings on which they sit; they also enable the home- or business-owner to save money beyond the monthly payments, savings that increase as electrical rates increase.

## **C. PV Success Stories**

In May 2007, Hall's Warehouse, in South Plainfield, New Jersey, completed a \$9 million PV system with 8,000 solar panels, which will produce 1.4 MW of electricity.<sup>161</sup> Incredibly, this system produces 1/10 of Hall's electricity demand.<sup>162</sup> The system, however, will pay for itself in 5 years because of the \$4.6 million in rebates and tax credits offered by New Jersey.<sup>163</sup> After the 5-year repayment period, Hall's will save hundreds of thousands of dollars per year, with avoided costs increasing along with prices. Over the 30-year life span of the system, moreover, the company will save the equivalent of 24,000 tons of carbon dioxide, or two million gallons of gasoline.<sup>164</sup>

Robert Felton, a California homeowner, paid about \$2,500 per month for electricity in 2005.<sup>165</sup> After installing a 45-kW system on his home's roof, "he seldom sees an electric bill (and) estimates the system could save (him) almost \$2 million over 30 years—far more than the \$255,000 the system cost him after a \$134,000 rebate."<sup>166</sup> This would be a 780% return on investment—before accounting for interest he could earn by investing the money he saved.

## **D. School PV Success Stories**

Schools around the country are already taking advantage of solar power to decrease operating costs. In 2002, the school district in Carle Place, Long Island spent \$200,000 to install five PV systems equaling approximately 50 kW<sup>167</sup> in its three schools.<sup>168</sup> For a district that paid \$200,000 per year in electricity for its lighting system

alone, “in its first year, the solar panels lowered the district’s electric bill by more than \$10,000.”<sup>169</sup> Like the San Francisco convention center project, this used no taxpayer money. The installer took no money upfront; instead, he will be paid back over 18 years.<sup>170</sup> Over just the 18 years it will take to repay the system, the school district estimates it “will generate a surplus of nearly a half-million dollars.”<sup>171</sup> Before taking into account the money it will save after the 18-year repayment period, this will be a 250% return on investment. According to the installer, “representatives from about a dozen Long Island districts had looked at the Carle Place system.”<sup>172</sup> Further, three other Long Island districts are already in the beginning stages of installing their own systems.<sup>173</sup> According to the Carle Place superintendent, the system has been beneficial in three ways: “[f]irst, we have drastically reduced our energy bills . . . in addition, we are reducing greenhouse gas emissions . . . and the third part is that this has provided us an opportunity to educate our students about solar energy and alternative energy resources.”<sup>174</sup>

In 2006, Monterey Ridge Elementary in Monterey, California installed 20,000 square feet of solar panels on land behind the school.<sup>175</sup> The 200-kW system, which will provide 40 percent to 60 percent of the school’s electricity needs, could generate enough power to serve 5,600 local homes.<sup>176</sup> The school district will pay roughly \$900,000 of the \$1.5 million price tag of the system, with the state rebate covering the other \$600,000.<sup>177</sup> The district will recoup the cost of the system in about 15 years.<sup>178</sup>

At Oberlin College in Ohio, the Environmental Studies Department’s parking lot added a PV-covered roof. The roof holds a 100-kW PV system; together with an existing 45-kW system, Oberlin’s PV now produces enough electricity to power 15 homes.<sup>179</sup> According to Green Energy Ohio, the system will be a “win for the College and for the City of Oberlin, which will benefit from the center’s electrical energy when surplus energy is exported into the municipal grid.”<sup>180</sup> With peak power production expected to be 30% more than the facility’s demand,<sup>181</sup> the College can sell its surplus to the local electrical company to increase its return on investment.<sup>182</sup>

## VII. NYC Public Schools and PV

In 2006, the entire state of California installed its highest load of PV: approximately 50 MW, enough to power 135,000 homes.<sup>183</sup> At the end of 2005, the entire nation’s PV capacity was 425 MW.<sup>184</sup> As soon as the City takes the initiative, NYC public schools alone could install 120 MW.<sup>185</sup> By creating an enormous-scale market, the City would enable private PV to reach its highest potential, offering all the benefits of PV to the entire city at the most efficient price.

### A. NYC’s Renewable Energy Potential

In 2003, the NYC Economic Development Corporation issued an “Energy Plan for the City of New York”

(“the Energy Plan”).<sup>186</sup> Though limited in scope as to PV, the Energy Plan speaks highly of PV potential in a city like NYC: “(PV) panels are well suited to urban areas because they are small and produce no noise or pollution.”<sup>187</sup> While the Energy Plan notes the high initial cost as a “primary hurdle,”<sup>188</sup> it writes glowingly about the “considerable benefits” for NYC, including PV being “modular, silent, create(ing) no pollution, can be operated unattended and require(s) little maintenance compared to other power plants.”<sup>189</sup> Further, it recognizes PV’s production occurs at peak demand periods.<sup>190</sup> Most consequential, the Energy Plan observes:

(PV) would be most valuable on heavily-loaded networks and high on tall buildings with heavily-loaded distribution. In both situations, the (PV) capacity would help to avoid the need to upgrade distribution, while achieving (*sic*) maximal reductions in line losses. Rooftop (PV) may also be helpful in shading roofs and reducing heat gain.<sup>191</sup>

The Energy Plan fails, however, to further delve into the possibilities of PV in the City. An 89-page document, it devotes roughly only 1½ pages to PV’s potential.<sup>192</sup>

Another New York City-financed study entitled “New York City’s Solar Energy Future,” (a two-part study: “Part 1” and “Part 2”) illustrates the current energy situation, while also showcasing the potential for PV in the City.<sup>193</sup> According to Part 1, “there is enough commercial and residential roof space to host between 8,500 MW and 15,700 MW of PV installations within the New York City area,”<sup>194</sup> or most all of our electrical demand.<sup>195</sup> In fact, reports suggest that 7,736 MW of PV—or 67% of projected electrical demand—could be installed within the area by 2022.<sup>196</sup> This development is not assured; nor is it even likely, unless the State and the City take major steps to alleviate the major barriers to private entry. The City has the potential to effect *major* changes in city energy use and production by purchasing large-scale PV for government buildings, specifically school buildings.

Two NYC laws intended to move the City toward a brighter renewable energy future already exist. Local Law 564-A (“LL 564”) requires the City, by Earth Day 2013 and 2022, to obtain 13% and 19% of its electricity from renewable sources, respectively.<sup>197</sup> The Council’s Introduction 381 (“Int. 381”) “requires the City to assess the feasibility of incorporating clean, on-site generation (such as PV) at its facilities.”<sup>198</sup> This project would help accomplish both of these goals. In fact, as to LL 564, this project alone possibly could represent nearly 13% of the City’s electricity.<sup>199</sup> As to Int. 381, this should illustrate the potential of clean, on-site power generation by the City, especially since renewable energy resources besides PV, such as wind and biomass, have little potential for on-site generation in City-owned buildings.<sup>200</sup>

## B. NYC Public Schools Demand and Potential

City agencies account for over 10% of energy use in the city.<sup>201</sup> The Department of Education (“DOE”) accounts for over 26% of that.<sup>202</sup> In the 2007 NYC Budget, electrical appropriations for the DOE were approximately \$204 million.<sup>203</sup> The DOE’s overall budget for 2007 is approximately \$14.1 billion.<sup>204</sup> Thus, electricity accounts for approximately 1.4% of the DOE’s budget. With approximately 1,200 public school buildings,<sup>205</sup> the average school building pays more than \$170,000 per year, or over \$14,000 per month, for electricity. This number is approximately equivalent to the base salary of nearly four first-year elementary-school teachers.<sup>206</sup>

These buildings, however, are mostly the highest and largest buildings in their respective neighborhoods. They are therefore perfect for large-scale PV projects, as they have mostly unimpeded access to sunlight.<sup>207</sup> These buildings are large enough to install 50-kW to 200-kW systems on the roofs.<sup>208</sup> This article will use a 100-kW system as the average, thereby making the potential for a DOE-wide system 120 MW.<sup>209</sup> Note, however, that 120 MW is most likely below the actual potential for school PV. Most schools have roofs large enough to fit systems well over 100-kW and receive unimpeded sunlight.<sup>210</sup> Further, this program could be opened to private schools, many of which are similarly the highest and largest buildings in their respective residential neighborhoods. For the sake of this paper, the conservative figure of 120 MW will suffice; both variables—average size and total number of buildings in the system—however, could mean drastically larger overall potential.

This project would be enormous on all levels, especially price. Energy Initiative 11 of Plan 2030 (“Initiative 11”), entitled “Foster the Market for Renewable Energy,” notes, “since City facilities are not eligible for NYSERDA incentives or tax credits, the economics for public solar projects are even more difficult than in the private sector.”<sup>211</sup> Using the cost of San Francisco’s Mascone Convention Center as a baseline,<sup>212</sup> installing 120 MW of PV, and installing energy efficient devices to decrease the school’s demand on NYC’s public schools would cost roughly \$1.4 billion. However, if state incentives similar to California’s were included, the cost would fall to just over \$1 billion—a \$400 million decrease. A federal expenditure on the project (not unreasonable given the project’s ability to jumpstart the industry, secure our energy supply, and make natural gas more readily available in other parts of the country) would lower the cost even more. Although the cost looks exorbitant, using the same San Francisco projections, the project’s cost would be paid off in 7½ years, or possibly less since electricity costs about 27% more in NYC than San Francisco.<sup>213</sup> Further, the PV systems would produce the most electricity when the schools are not in use—during the summer.<sup>214</sup> This is concurrent to NYC’s peak electricity demand. The schools, like Oberlin College and their PV-covered park-

ing lot,<sup>215</sup> will receive even greater net-metering gains than a typical building (due to less demand from the schools during these peak periods). Together, this means the project could be paid off even faster. Finally, according to the EPA, 120 MW of PV saves approximately 344 million pounds of carbon dioxide *per year*—the equivalent of 40,000 acres of trees.<sup>216</sup> In NYC terms, this would be equivalent to planting 47 Central Parks every year for the life of the system.<sup>217</sup>

Under current law, city agencies, including the Department of Education, have absolutely no incentive to reduce their energy use.<sup>218</sup> Since the Department of City-wide Administrative Services pays the electricity bills for all City agencies, the agencies do not see any of the savings.<sup>219</sup> In fact, agencies have an incentive to oppose investments; less money will be available to them in their capital funds if they devote money to electricity reduction.<sup>220</sup> While amending the system to facilitate efficiency within various agencies would be an important method of lowering energy costs and demand, and should be done to encourage less energy consumption by the City, this system should be financed at the City level.

Initiative 11 envisions private companies operating public PV systems. The City plans to “release an RFP (‘request for proposal’) to attract private solar developers to build, own, operate, and maintain the panels on City buildings. The City will enter into a long-term contract with the developer to purchase the solar energy generated by these panels.”<sup>221</sup>

The plan, while a well-meaning attempt to jumpstart solar development in NYC, would not be in the best interests of NYC. Like the PV examples touched upon earlier, this project can be undertaken without spending one dollar of taxpayer money, while still allowing the City to own (and reap the full benefits of) the system. The City can finance it through publicly backed bonds, like San Francisco, or by paying back installers over the life of the system, like in Carle Place, Long Island. If studies found the NYC public school PV projected similarly to San Francisco’s, the most effective way to finance the project would be to sell 30-year bonds. The system would be paid back faster than 30 years, as every example illustrates. The money saved over the remaining years can be invested in funds earning more than the low-interest bonds pay out, thereby giving the City an even higher return on its investment. Money saved on the project could go to a number of sources including teacher pay, school construction, or a mix of those plus a fund to encourage green energy development and energy efficiency in the private sector.

Further, Initiative 11 states the City will work with the State and Public Service Commission to lower the barriers for PV systems in NYC.<sup>222</sup> Initiative 11 notes two barriers: the maximum amount of grid-connected PV and the amount of power that can be sold back to the grid.<sup>223</sup> If the City is willing to work with the State to lower those



barriers, why not work to make State incentives, such as those offered to San Francisco's Mascone Center—available to City-owned buildings? New York State has an interest in lowering demand for fossil fuels; this would be the perfect way to jumpstart the PV industry statewide, while avoiding school costs not directly associated with the teaching of its children.

### VIII. Other Benefits of PV installation

As former NYS Comptroller Alan Hevesi wrote, “conventional energy sources have benefited from sizable tax incentives and subsidies; if similar incentives were directed toward renewable energy technologies, the gap between conventional and renewable energy costs would narrow even further.”<sup>224</sup> All levels of our government subsidize or help fund conventional energy production; why should NYC not invest in renewable energy?

In every aspect, renewable energy production is superior to conventional energy production. As Comptroller Hevesi's report notes:

[B]y generating more renewable energy, the State could spur job growth in a high-skilled, high-wage sector; stimulate in-state investments; increase tax revenue; retain energy expenditures that currently leave New York; cut back on the release of harmful pollutants; reduce public health care costs; reduce State dependence on foreign oil; and provide consumers with energy that is not subject to the volatile fluctuations of petroleum and natural gas prices.<sup>225</sup>

Studies show that renewable energy creates 40% more jobs per dollar invested than more conventional production industries.<sup>226</sup> Renewable energy jobs are labor-intensive; they generate high-paying jobs in research and development,<sup>227</sup> which could attract students and professors to NYC's own Columbia University and Cooper Union, two of the top scientific research universities in the nation. PV would also create well paying jobs in NYC, due to strong support for labor unions.<sup>228</sup> As “Repowering Gotham” notes, NYC has a large, highly skilled manufacturing workforce.<sup>229</sup> Manufacturing jobs, however, declined by 33% in the 1990s;<sup>230</sup> widespread PV installation could help revitalize the sector in NYC. According to Jeff Rickert, vice president of the Apollo Alliance, “from a labor unions' point of view, these are the kinds of jobs their unions are most prepared for.”<sup>231</sup>

Public school rooftop PV would supply only 120 MW at peak production points (sunny early-afternoons); current NYC electrical demand is over 9,000 MW. While it will help eliminate a great deal of the electrical costs for NYC public schools, it will barely dent the electrical needs of NYC as a whole. This plan will spur private installations, however, and, to lower their costs, will encourage

PV businesses to manufacture their panels in the city.<sup>232</sup> The high initial cost of PV systems drastically reduces private PV use. According to the United States Department of Energy, however, mass production and installation of PV could greatly reduce the cost,<sup>233</sup> thereby making it more attractive to home- and business-owners. Its study showed that, since 1993, the Sacramento Municipal Utility District had installed 10 MW of PV; since then, every year, PV achieved nearly 11% reductions in cost.<sup>234</sup>

The City can leverage its commitment to install 120 MW of PV to entice manufacturers to open a factory in NYC. When Chicago made commitments of only \$2 million and \$6 million, respectively, it was able to “lure” Spire Corporation to build a factory on a brownfield on the west side of Chicago.<sup>235</sup> Surely, the City can count on luring manufacturers to NYC with a commitment of over \$1 billion.

According to the Renewable Energy Policy Project (REPP), a national non-profit organization funded, in part, by the U.S. Environmental Protection Agency, “significantly increasing the U.S. market for renewable energy will require federal, state, and local governments to substantially increase their purchasing of PV.”<sup>236</sup> REPP states that there are two main rationales for government to take the lead in PV purchase: it can resolve the “chicken and egg” dilemma associated with new technology and it can help overcome institutional barriers to commercialization.<sup>237</sup> The purchase of a 120 MW PV system will allow the economies of scale to reach a more efficient point, lowering the cost, which, in turn, will lead to private market demand. Increasing private market demand will further increase competition amongst manufacturers and installers, which will lower the prices even further.

#### A. Potential Problems and Solutions

Con Ed's power system ensures that NYC has the most reliable electrical grid in the nation;<sup>238</sup> at the same time, even the company recognizes that it is “one of the most complex systems in the world.”<sup>239</sup> The grid design and state regulations make PV grid interconnection in NYC very difficult to accomplish on a large scale. According to Professor Stephen Hammer, then of the London School of Economics, “renewable sources linked to the Con Ed grid can run into problems if the device produces more power than is used by the customer.”<sup>240</sup> Con Ed's specifications limit the size of interconnection or require them to install expensive equipment that can disconnect the system from the grid in case of an emergency.<sup>241</sup>

However, as mentioned above, the New York State Public Service Commission ordered New York utilities to decouple profit from use,<sup>242</sup> which will alleviate some of these concerns. Professor Hammer offers several additional ways to circumvent these problems: first, for larger installations, power could be sent directly into Con Ed's high voltage feeder lines, which currently allows the PV owner (in this case, the City) to earn a fee equal to the lo-

cal marginal electricity price for the power it produces.<sup>243</sup> Another solution is to set up a “micro-grid” between the PV system and the adjacent buildings, on top of Cod Ed’s grid, wherein the PV owner could sell its surplus energy to its neighbors.<sup>244</sup> This method, according to Professor Hammer, is currently illegal in NYS: “[t]ariffs detailing the rate to be charged to customers for the surplus power must first be established by State regulators, and permission must also be granted by the City of New York.”<sup>245</sup> One possible tariff solution would be to give the PV owner half of the rate at the time of sale back to the grid. If the summer afternoon price is \$0.20 per kWh, then the PV owner would receive a \$0.10 per kWh credit. If, during a non-peak period, the price is \$0.16 per kWh, the PV owner would receive \$0.08 kWh. This solution would provide a fair and demand-driven tariff for PV owners, rather than a pre-determined tariff, like in Germany, that might not reflect the price of electricity.<sup>246</sup>

## IX. Conclusion

New York City’s increasing population and electrical demand put ever-tightening pressure on residents, businesses, land-use, and the local and worldwide environment. The only way NYC can continue to be the “capital of the world” without choking itself on fumes or building a power plant in Central Park’s Sheep Meadow is to begin a large-scale investment, both publicly and privately, in renewable energy. As a geographically small but tall city, NYC’s best investment would be in photovoltaic solar systems. To jumpstart private installation, the City of New York should purchase PV for the New York City public school system. This system will allow NYC to spend less on infrastructure and more on educating students. Through the economies of scale, the system will help lower the cost of private installations, revitalize NYC’s manufacturing sector and create high paying, often unionized, jobs. It will help reduce NYC greenhouse gas emissions, public health care costs, and dependence on foreign oil, while providing a barrier for NYC residents against energy price fluctuations. Together with energy efficiency techniques, in the long-term, NYC could produce a great deal of its daytime electricity with PV, drastically reducing its dependence on conventional energy production and ensure only the cleanest, most efficient power plants remain in operation.

All it takes is strong-willed and forward-looking government support. As the many reports cited throughout this paper demonstrate, when planning for future energy needs, many people in, and affiliated with, government recognize the incredibly diverse benefits of solar energy. However, in each report, most of the discussion is dedicated to conventional sources of energy. Change of this magnitude—and the high initial cost—can be dissuasive to politicians and budget-writers. Officials who understand, and take advantage of, the benefits of PV will be at the forefront; they will stop spending taxpayer money on unnecessary expenses and start adding jobs and tax rev-

enue to their locales. More importantly, their investment will spark private PV installation, which will have greater overall benefits to their communities.

## Endnotes

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3. Associated Press, *Power Line Pits City Energy Needs Against Upstate Opposition*, N.Y. Sun, March 5, 2007.
4. MAINTAINNYC, available at [http://home2.nyc.gov/html/planyc2030/downloads/pdf/maintainyc\\_energy.pdf](http://home2.nyc.gov/html/planyc2030/downloads/pdf/maintainyc_energy.pdf); See also PLANNYC, available at [http://home2.nyc.gov/html/planyc2030/downloads/pdf/full\\_report.pdf](http://home2.nyc.gov/html/planyc2030/downloads/pdf/full_report.pdf). 1 GW = 1,000 MW; 1 MW produces enough electricity to power roughly 1,000 homes.
5. MAINTAINNYC, *supra* note 4 at 4.
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12. PLANNYC, *supra* note 4, at 121.
13. See generally, NYC APOLLO ALLIANCE, LETTER TO THE NEW YORK STATE PUBLIC SERVICE COMMISSION 3 (2006) (noting “the [PSC] should view this summer’s energy crisis as a catalyst for future collaboration . . . to think of innovative and sustainable ways to address energy consumption and conservation”), available at <http://www.urbanagenda.org/pdf/PSCQueensPowerOutage.pdf>.
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16. Sam Williams, *Wind Power in NYC*, Gotham Gazette, March 8, 2006, available at <http://www.gothamgazette.com/article/environment/20060308/7/1782>.
17. *Id.*
18. *Id.*
19. Verdant Power, The RITE Project, <http://www.verdantpower.com/what-initiative> (last visited Mar. 13, 2008).
20. *Id.*
21. Note: while tidal and wind are not able to meet solar energy's potential, their contribution would certainly be welcome as against conventional energy production, direct government investment probably is not worth the trouble. Because there is little additional potential, the government would not be able to stimulate the market, nor would it be able to invest in either on City-owned land.
22. See PLANYC, *supra* note 4, at 112 (noting "of all the renewable energy sources, solar currently has the great potential to generate electricity within the five boroughs").
23. See *infra* pp. 30-31.
24. Nathan Duke, *City pays double national average for ConEd: Gioia*, Queens Times Ledger, March 15, 2007.
25. One kWh is equal to 1,000 watt-hours, or the "unit of work or energy equal to that expended by one kilowatt in one hour." <http://www.merriam-webster.com/dictionary/kilowatt%20hour>.
26. See Duke, *supra* note 24.
27. *Id.*
28. *Id.*
29. *Id.*
30. N.Y. COMP. CODES R. & REGS. tit. 9 § 5.111 (2001).
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34. *Id.* at 2 (noting the ability of energy efficiency to reduce demand and forestall the need for new power plants). This statement, however, is also applicable to PV's ability to negate the need for power plants.
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46. *Id.*
47. *Id.*
48. *Id.*
49. *Id.* at 31.
50. New York City Local Law No. 661, chs. 8, § 24-801-§ 24-808 (2005).
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53. *Id.*
54. *Id.*
55. *Id.*
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57. Residential Electricity Guide, U.S. Department of Energy, Energy Information Administration, available at <http://www.eia.doe.gov/neic/brochure/electricity/electricity.html> (noting in 2003, New York State paid \$14.31/kWh, while Vermont paid the second highest at \$12.82/kWh).
58. PLANYC, *supra* note 4, at 30.
59. See *id.* at 4.
60. Air Quality Survey for PLANYC, available at [http://home2.nyc.gov/html/planyc2030/downloads/pdf/greenyc\\_air\\_quality.pdf](http://home2.nyc.gov/html/planyc2030/downloads/pdf/greenyc_air_quality.pdf) (noting NYC is already out of compliance with national standards in ozone levels and small particles).
61. *Id.* at 4 (noting that "experts suggest other diseases are also correlated to the presence of significant quantities of air pollution").
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81. *Id.*
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83. The Vote Solar Initiative, *Solar is Reliable*, <http://www.votesolar.org/reliable.html> [hereinafter *Solar is Reliable*].
84. *Id.*
85. The Vote Solar Initiative, *About Vote Solar*, <http://www.votesolar.org/about/index.html>.
86. The Vote Solar Initiative, *supra* note 83.
87. Though, of course, an individual system won't lower the price by an amount one can see. For instance, a 60kW system might produce 40kW; but with NYC's demand at 9 GW, that will not lower demand appreciably. If PV were installed on a large scale, though, supply demanded would be equally lower. At that point, prices would decline appreciably.
88. Although the New York State Public Service Commission provides the City of NY with electricity, Con Ed controls the power lines and, thus, the delivery of the City's power. Hence, this plan would include selling the excess electricity to Con Ed, who will pay the DOE at a rate to be determined.
89. See, e.g., U.S. DEP'T OF ENERGY, NET METERING POLICIES, *available at* <http://www.eere.energy.gov/greenpower/markets/netmetering.shtml>.
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106. James, *supra* note 97.
107. *Id.*
108. City Successes, The Vote Solar Initiative, at 2, <http://www.votesolar.com/city-initiatives/successes.html>.
109. *Id.*
110. MASCON CASE STUDY, *supra* note 44 (Blackouts and soaring energy prices will similarly affect New York City if the city does not increase supply or lower demand.).
111. *Id.*
112. *Id.*
113. *Id.*
114. *Id.*
115. *Id.* (The electricity rate was \$0.15/kWh. The government of NYC currently receives power from NYPA; the cost is approximately the same, but will likely increase as demand meets supply. Thus, any solar project could potentially save more money relative to the size of the project.).
116. *Id.*
117. *Id.* at 2.
118. Go Solar California, California Public Utilities Commission, <http://www.gosolarcalifornia.ca.gov/csi/index.html> (last visited April 10, 2008).
119. *Id.*
120. CALIFORNIA PUBLIC UTILITIES COMMISSION, CALIFORNIA SOLAR INITIATIVE HANDBOOK 1-2 (2008), *available at* [http://www.cpuc.ca.gov/NR/rdonlyres/A4E6B6BD-0D6E-4C5F-BBA1-F2712B491577/0/CSI\\_Handbook\\_1\\_08.pdf](http://www.cpuc.ca.gov/NR/rdonlyres/A4E6B6BD-0D6E-4C5F-BBA1-F2712B491577/0/CSI_Handbook_1_08.pdf) [hereinafter HANDBOOK].
121. *Id.*
122. *Id.*
123. *Id.* at 1-7.
124. *Id.* at 30.
125. *Id.* at 7.
126. *Id.* at 86. This seems to be a stopgap for subsidies for systems meant for profit.
127. *Id.* Although this should not be a problem for the program: as noted earlier, systems generally have 25-year warranties. See *Solar is Reliable*, *supra* note 83.
128. HANDBOOK, *supra* note 120, at 23.

129. *Id.* at 30.
130. *Id.* at 34.
131. *Id.* at 35.
132. *Id.* at 1.
133. *Id.* at 7.
134. *Id.* at 35.
135. *Id.* at 42.
136. CALIFORNIA PUBLIC UTILITIES COMMISSION, ENERGY ACTION PLAN II: IMPLEMENTATION ROADMAP FOR ENERGY POLICIES 3 (2005), *available at* [http://docs.cpuc.ca.gov/word\\_pdf/REPORT/51604.pdf](http://docs.cpuc.ca.gov/word_pdf/REPORT/51604.pdf).
137. *Id.* at 2.
138. THE VOTE SOLAR INITIATIVE, CALIFORNIA SOLAR INITIATIVE - ECONOMIC BENEFITS OF AVOIDED ELECTRICITY PURCHASES, *available at* [http://www.votesolar.com/resources/downloads/CSI\\_Econ.pdf](http://www.votesolar.com/resources/downloads/CSI_Econ.pdf) [hereinafter ECONOMIC BENEFITS]; *see also* THE VOTE SOLAR INITIATIVE, VOTE SOLAR ANALYSIS OF CALIFORNIA SOLAR INITIATIVE BENEFIT, *available at* [http://www.votesolar.com/resources/downloads/CSI\\_Model.pdf](http://www.votesolar.com/resources/downloads/CSI_Model.pdf) [hereinafter ANALYSIS].
139. ECONOMIC BENEFITS, *supra* note 139 (All dollar amounts are in 2005 dollars. Real savings will be higher in 2031 (the end of the 25-year period) to reflect inflation).
140. *Id.*
141. *Id.*
142. *Id.* The program costs roughly \$2.4 billion. The net avoided costs, then, are 50% of the costs under the *lowest* scenario.
143. ANALYSIS, *supra* note 138.
144. CALIFORNIA ENERGY COMMISSION, CALIFORNIA STATE-WIDE WEIGHTED AVERAGE RETAIL ELECTRICITY PRICES BY SECTOR (2006), *available at* [http://www.energy.ca.gov/electricity/statewide\\_weightavg\\_sector.html](http://www.energy.ca.gov/electricity/statewide_weightavg_sector.html).
145. *Id.*
146. ANALYSIS, *supra* note 138.
147. *Id.*
148. Center for Study of Responsive Law, Government Purchasing Project, "Photovoltaics: Striking It Green." *available at* [http://www.gpp.org/energy\\_ideas/EI.0296/EI.0296.04.html](http://www.gpp.org/energy_ideas/EI.0296/EI.0296.04.html).
149. 26 U.S.C. § 25 (2005).
150. *Id.* at (a)(2).
151. Damon Darlin, *Your Money: Financially, Solar Power for the Home Is a Tough Sell*, N.Y. TIMES, April 14, 2007, at C6.
152. *See* NYSERDA Clean Power Estimator, Power Naturally, New York State Energy Research and Development Authority ("NYSERDA"), *available at* <http://www.powernaturally.org/default.asp>.
153. NYSERDA, PV Incentives, Power Naturally, *available at* <http://www.powernaturally.org/Programs/Solar/incentives.asp>.
154. *See* ECONOMIC BENEFITS, *supra* note 138.
155. *Id.* Note, too, incentives help increase the rate of installation, which will, in the long-run, lower the cost of PV systems.
156. These costs, of course, do not include the other benefits of PV noted above. *See* discussion pp. 13-16.
157. Gregory Dicum, *Green Solar Gets Practical*, S.F. GATE, January 25, 2006.
158. Darlin, *supra* note 151.
159. *Id.*
160. Dicum, *supra* note 157.
161. Kirsty Sucato, *A Company Puts Itself on Solid Solar-Power Footing*, N.Y. TIMES, April 1, 2007, at 14N17.
162. *Id.*
163. *Id.*
164. *Id.*
165. Gregory Dicum, *Plugging into the Sun*, N.Y. TIMES, January 4, 2007, at F1.
166. *Id.*
167. Interstate Renewable Energy Council, *Schools Going Solar*, January 23, 2007, *available at* <http://www.irecusa.org/index.php?id=36>.
168. Linda Saslow, *Turning Green, Schools Lead in Solar Energy*, N.Y. TIMES, March 4, 2007, at 14LI5.
169. *Id.* Note, too, that the district saved an additional \$60,000 by changing to "more energy-efficient bulbs."
170. *Id.*
171. *Id.*
172. *Id.*
173. *Id.*
174. *Id.*
175. Blanca Gonzalez, *Monterrey Ridge Elementary (CA) Goes With Lots of Solar*, SAN DIEGO UNION TRIBUNE, August 18, 2006, at NC3.
176. *Id.*
177. *Id.*
178. *Id.*
179. Oberlin College Completes Solar Parking Pavilion, Green Energy Ohio, April 14, 2006, *available at* <http://www.greenenergyohio.org/page.cfm?pageID=968> [hereinafter *Oberlin Solar*].
180. *Id.*
181. *Id.*
182. *Id.*
183. Dicum, *supra* note 165.
184. *Id.*
185. *See infra* pp. 30-31.
186. CHERNICK, *supra* note 9.
187. *Id.* at 71.
188. *Id.*
189. *Id.* at 72.
190. *Id.* (noting PV production occurs when "electricity is needed most (and is most valuable)").
191. *Id.*
192. *Id.* at 71-73.
193. CSE MARKET, *supra* note 62; *see also* THE CTR. FOR SUSTAINABLE ENERGY AT BRONX CMY COLL., NEW YORK CITY'S SOLAR ENERGY FUTURE, PART II: SOLAR ENERGY POLICIES AND BARRIERS IN NEW YORK CITY, January 2007, *available at* [http://www.bcc.cuny.edu/institutionalDevelopment/cse/CUNYPV\\_%20PolicyAndBarriersStudy.pdf](http://www.bcc.cuny.edu/institutionalDevelopment/cse/CUNYPV_%20PolicyAndBarriersStudy.pdf). (prepared for The City University of New York's "Million Solar Roofs Initiative").
194. *Id.*
195. *See* MAINTAINNYC, *supra* note 4, at 4 (showing that New York City's current electrical demand is 9,000 MW and will increase to 11.5 MW by 2030).
196. *Id.*
197. WORKING TOWARDS A SUSTAINABLE CITY, *supra* note 45, at 41-42.
198. *Id.* at 42.
199. *See infra* note 202 (noting that the DOE uses 26% of the City government's electricity. The PV system produces electricity during the day, which is when schools are in session and using almost all of their electricity). Therefore, if this system could

- produce approximately 50% of the schools overall electricity, it would equal 13% of the City's government's electrical demand, or approximately 2.6% of NYC's electrical demand.
200. *Supra* notes 15-21.
  201. WORKING TOWARDS A SUSTAINABLE CITY, *supra* note 45, at 31.
  202. NYC Department of Citywide Administrative Services, *available at* <http://www.nyc.gov>. While DCAS handles electricity for DOE, it does not handle heat. Therefore, although the DOE accounts for 26% of DCAS's *energy* purchase and because DCAS purchases gas for other agencies, DOE's percentage of City electrical demand is actually higher than the DCAS chart indicates.
  203. *Id.*
  204. NYC Department of Education, Department of Budget Operations and Review, [http://schools.nyc.gov/offices/d\\_chanc\\_oper/budget/dbor/question/questions.html](http://schools.nyc.gov/offices/d_chanc_oper/budget/dbor/question/questions.html).
  205. NYC Department of Education, School Construction Authority, About the SCA, <http://schools.nyc.gov/Offices/SCA/AboutUs/default.htm> (last visited Mar. 3, 2008).
  206. NYC Department of Education, Division of Human Resources, Salary Step, 2007, <http://schools.nyc.gov/Offices/DHR/MostPopularClicks/TeacherSalaryStepDifferential.htm> (last visited April 10, 2008).
  207. Other buildings might shade some schools, especially schools in Manhattan. However, because many schools could hold over 100kW systems, the system as a whole would still likely average approximately 100kw per school, if not greater.
  208. An estimate based on the current capability of PV panels and the size of city schools.
  209. 100 kW times 1,200 schools equals approximately 120 MW. Although some schools are smaller and, especially in Manhattan, might be shaded by other buildings, the total average of potential is still likely equal or greater than 120 MW. Most public school buildings could hold well over 100 kW of PV. The 120 MW number, therefore, remains a viable, if low-end, potential for NYC public schools.
  210. *Id.*
  211. Energy Report for PLANYC, at 15, *available at* [http://www.nyc.gov/html/planyc2030/downloads/pdf/report\\_energy.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/report_energy.pdf).
  212. MASCOE CASE STUDY, *supra* note 44.
  213. *See* Duke, *supra* note 24.
  214. *See* Spitzer, *supra* note 33 (noting that "experts say that a 1 percent reduction in demand during peak periods can reduce electricity prices by 10 percent).
  215. *See* Oberlin Solar, *supra* note 179.
  216. APOLLO ALLIANCE, NEW ENERGY FOR CITIES 4, *available at* [http://www.apolloalliance.org/docUploads/new\\_energy\\_cities.pdf](http://www.apolloalliance.org/docUploads/new_energy_cities.pdf).
  217. The NYC Department of Parks and Recreation, [http://www.nycgovparks.org/sub\\_your\\_park/park\\_info\\_pages/park\\_info.php?propID=M010](http://www.nycgovparks.org/sub_your_park/park_info_pages/park_info.php?propID=M010) (Central Park is approximately 840 acres).
  218. MASCOE CASE STUDY, *supra* note 44, at 33.
  219. *Id.*
  220. *Id.*
  221. PLANYC, *supra* note 4, at 15.
  222. *Id.*
  223. *Id.*
  224. ALAN G. HEVESI, NEW YORK STATE, ENERGIZING THE FUTURE: THE BENEFITS OF RENEWABLE ENERGY FOR NEW YORK STATE (2005).
  225. *Id.*
  226. *Id.* These jobs are in the areas of construction, manufacturing and installation. Jobs from fossil fuels are limited to production locations; for example, petroleum jobs are focused around sites that produce petroleum, such as Saudi Arabia and Iran. *See also* Sam Eaton, *Getting a Slice of the Green Economy*, Marketplace Money, Apr. 2007, *available at* [http://marketplacemoney.publicradio.org/display/web/2007/04/13/green\\_jobs](http://marketplacemoney.publicradio.org/display/web/2007/04/13/green_jobs) (quoting Kevin Doyle of the Environmental Careers Organization: "[J]obs in (environmental consulting and engineering) are expected to grow 5.5 percent a year through the end of the decade.").
  227. HEVESI, *supra* note 224.
  228. *See* HEVESI, *supra* note 224 (noting "unions are aware of the job growth potential for highly skilled construction and manufacturing labor"); *see also* Spitzer, *supra* note 33.
  229. NYC APOLLO ALLIANCE, *supra* note 65.
  230. *Id.*
  231. Moises Velasquez-Manoff, *Unions See Greenbacks in 'Green' Future*, The Christian Science Monitor, Jan. 2007.
  232. MARK BOLINGER ET AL., U.S. DEPARTMENT OF ENERGY, USING BULK PURCHASE COMMITMENTS TO FOSTER SUSTAINED ORDERLY DEVELOPMENT AND COMMERCIALIZATION OF PV (2002), *available at* [http://eetd.lbl.gov/ea/EMS/cases/Bulk\\_Purchases.pdf](http://eetd.lbl.gov/ea/EMS/cases/Bulk_Purchases.pdf).
  233. *Id.*
  234. *Id.*
  235. *Id.* at 5.
  236. JOEL STRONGBERG & VIRINDER SINGH, GOVERNMENT PROCUREMENT TO EXPAND PV MARKETS (1998), *available at* <http://www.crest.org/repp-pubs/pdf/pv4.pdf>.
  237. *Id.*
  238. CON EDISON, *supra* note 6.
  239. *Id.*
  240. STEPHEN HAMMER, THE CTR. FOR SUSTAINABLE ENERGY AT BRONX CMTY COLL., POWERING THE BIG APPLE (2004), *available at* [http://www.bcc.cuny.edu/InstitutionalDevelopment/CSE/Solar\\_Power\\_oct-1.cfm](http://www.bcc.cuny.edu/InstitutionalDevelopment/CSE/Solar_Power_oct-1.cfm).
  241. *Id.*
  242. *See* New York State Public Service Commission, *supra* note 92.
  243. HAMMER, *supra* note 241.
  244. *Id.*
  245. *Id.*
  246. *See, e.g.,* Solarbuzz.com, *supra* note 99. This method could lead to less electrical production by utilities if the tariff is too high. For instance, if the demand price is \$0.20/kWh and the tariff is \$0.15, the utility would make \$0.05/kWh minus the cost of production, which could be higher than \$0.05/kWh. Thus the utility would lose money for every kWh it produces; it would, therefore, produce less electricity until the lower supply increases the price enough to equal costs.

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# Dirty IP: Greentech and Cleantech Value Appreciation

By David A. Kalow and Shadaia Gooden

## I. Introduction

In the world of intellectual property, “green” is the new black. In view of the increased focus on environmentally friendly practices, more and more business are seeing green—both figuratively and literally.

As part of corporate “greening,” organizations are not only developing new processes that promote and protect the health of the environment, but also scientific and technological advances that, either independently or in combination with other relevant improvements in the field, can be used to enhance profits and to promote the underlying objectives of the green movement.

Another aspect of “greening” occurs when organizations are able to capitalize on the substantial opportunities provided by the burgeoning green fields. The development of any new concept—including processes and products—provides an opportunity for financial gain. The organizations best poised to take advantage of this potential are those organizations that have real protection of their newly created or acquired intellectual property (“IP”) and have developed a deep strategy for managing those assets.

Recently, more companies are appreciating the potential value of their intangible assets, such as those protected by intellectual property law. Many organizations now recognize the importance of pursuing protection of their IP interest not only as a minimum requirement to maintain the core business, but more importantly, for the potential to add value to that business. Sophisticated organizations now recognize that IP is more than merely a means to protect a corporation’s product or service, but is also a means to generate revenue and profit, and to secure working capital. In fact, IP is now a vital aspect of corporate performance—especially given the potential for higher margins as compared with other traditional lines of business, e.g., land-based or factory-based wealth.

Today’s economy is increasingly knowledge-based, thus making IP an essential component of a given company’s portfolio. Just two decades ago, on average, a U.S. company’s portfolio was made up of more than 60% in tangible assets. Now, that number has fallen below 15%, with a larger percentage of an average corporate portfolio being dedicated to intangible assets.<sup>1</sup> Specifically, one report shows, on average, the IP assets of corporations grew between 1978 and 2006 from 15% to 85%.<sup>2</sup>

Alan Greenspan, at least until recently one of this nation’s foremost economists, has recognized the significance of this trend and stated:

... the fraction of the total output of our economy that is essentially conceptual

rather than physical has been rising ... as the value of raw materials has accounted for only a fraction of the overall growth of the U.S. gross domestic product (GDP). The rest of that growth reflects the embodiment of ideas in products and services that consumers value. This shift of emphasis from physical materials to ideas as the core of value creation appears to have accelerated in recent decades.<sup>3</sup>

In short, there is significant value in IP and more companies are recognizing that value as a critical component of their business and business development. This trend is true regardless of the function of the core business. Further, these organizations are now seeking ways to increase the value of that IP. The ability to capture relevant IP and maximize the value of that IP is especially important during times of economic hardship, times of new business formation and times when business opportunities are being explored—consistent with the current economic environment and trend to capitalize on clean and green technologies.

Despite the many benefits of securing IP, there are also some unique challenges that come with IP management. These challenges are amplified in the area of environmentally conscious technologies.

## II. Green v. Clean

For many people, “going green” simply means an increased awareness of the environment and the negative impact that our daily activities can have on the environment. This understanding often translates to a newfound level of environmental and social responsibility that is manifested through a variety of simple behavior modifications such as recycling, utilizing mass transit and unplugging appliances when they are not in use in order to minimize energy consumption.

However, on a larger scale, corporations are not only promoting responsible behaviors but they are also developing entire businesses around processes and technologies to curb the negative impact of human involvement on the environment. The field that encompasses these technological advances is often termed “green technology” or “greentech” for short.

More specifically, what is greentech? Greentech can be defined as the practice of applying the teachings of environmental science, as well as other technical principles, to the task of conserving the natural environment. Generally, the greentech industry seeks to develop sustainable alternatives that are not only environmentally sound, but also economically and socially viable. Greentech is also com-

monly referred to as “environmental technology” (“envirotech”) or “clean business technology” (“cleantech”).

Although greentech, envirotech and cleantech are often used interchangeably, some slight distinctions can be made. Specifically, while greentech and envirotech seemingly focus more on the socially conscious aspects of protecting the environment, the term cleantech is more commonly used in reference to the profit-making business side of environmental protection.

Broadly, the cleantech and greentech industries present an array of opportunity for, e.g., scientists, engineers and innovators to provide solutions that address the demands of society now and in the future, without causing further damage or depletion of natural resources. Innovations in sustainability measures and renewable energy, “cradle to cradle” product designs to fully re-claim and re-use all components of products, clean energy alternatives to current energy generation methods, as well as green chemistry and green engineering methods, are a few of the areas experiencing explosive growth and development. New developments in these greentech areas not only benefit the environment, but also create opportunities for economic growth around these newly created markets.

Capturing, using and managing IP is fundamental to taking advantage of the economic expansion in these areas. Thus, intellectual property law provides several useful tools for protecting IP in the green market, with lessons learned from other markets such as biotech, software, nanotech, and the pharmaceutical industry, which experienced similar growth.

### **III. IP Overview—Types of IP and Activities for Protection**

#### **A. Welcome to the Matrix—Types of IP**

Generally, intellectual property, or IP, refers to the exclusive bundle of property rights granted to the creations of the mind. Intellectual property can come in a variety of forms such as a unique product or service, the result of research and development, or the company name and logo. Most commonly, this IP is protected through one or more of: the grant of a patent, trademark, copyright, or as the result of maintaining a trade secret. Although there is some potential for overlap when considering the advanced strategies for IP protection, generally each type of protection is designed to accomplish a particular objective.

##### **1. Patents**

Patent protection, like copyright, is explicitly covered in the U.S. Constitution. Article 1, Section 8 grants Congress the power “to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” Thus, patent rights offer a limited period of exclusivity to the owner—a “negative” right, allowing the owner the right to exclude others from making or using

the invention or innovation. The policy of patent law is to reward inventors, to reward investors who finance bringing inventions to market, and to encourage disclosure over secrecy in favor of ever-increasing public knowledge. A limited period of exclusivity is a key incentive underlying the entire foundation of patent law—to encourage inventor disclosures and to reward the investment of resources and bearing the risk of bringing a product to market.

Patents may be granted for a new, useful composition of matter, machine, article of manufacture, or process. Also, to receive patent protection, the invention must not already be known or in the public domain, or otherwise obviated by combining commonly known information. Further, while patent protection grants an owner the right to exclude the use of the invention by others, it is important to be clear that it does not grant a positive right for the owner to actually use the invention himself. Ironically, the use of the patent owner’s own invention may be prohibited if infringing on the rights granted to another owner under the claims of another patent.

Patents are a cornerstone of IP protection. As technology advances, patents have become an increasingly popular means of IP protection. The number of patents that have been filed has increased exponentially since 1990.<sup>4</sup> In the area of greentech or cleantech, patents are especially a vital component in protecting innovative concepts. As the field continues to evolve, the number of patent filings will likely continue to increase, subject of course to slowdowns from the present economic state.

##### **2. Trademark**

Trademarks are used to protect a word, group of words or a logo that is used in connection with the sale of goods or services. The foundation principle of trademark law is to associate the particular goods or services with their source. This is to protect consumers and to ensure that they are getting the goods or services that they intended to purchase. Although trademark protection does not stop the copying of products and ideas, it is intended to represent the authenticity of the product by identifying the maker of the goods or the entity that guarantees the quality of the goods.<sup>5</sup> Thus, strong trademarks help build and protect the goodwill of the organization in the eyes of the public.

In every industry, developing goodwill within a company is essential to long-term success. The popularity of the green movement has led to a significant increase in the number of “eco-mark” applications filed with the Patent and Trademark Office.<sup>6</sup> Many organizations are seeking to incorporate eco-friendly terms such as “green,” “clean,” and “environment” into their marks. This increase represents a strategic move by the filing organizations to build their green brands and jockey for position as a leader in the green field. However, as many of the common eco-terms are generic, or at best weak in reference to the goods or services they are being used to describe, it is not clear

what the long-term value of the marks will be. In some instances, where the incorporation of an eco-term appears superficial, it may in fact hurt the credibility of an organization looking to build a sustained connection with the market. Thus, as with any IP, it is important to think ahead of what the potential end result may be.

### 3. Copyright

The rights afforded by copyright protection also find roots in Article I, Section 8 of the U.S. Constitution. Copyright protection is extended to literary, musical and dramatic works, pictorial, sculptural and audiovisual works, including computer programs or any other kind of works of authorship that can be fixed in a tangible medium.

The owner of a copyright is granted the exclusive right to his or her work, including the right to reproduce and distribute the work as well as to prepare derivative works based on the protected original. In a greentech or cleantech environment, copyright protection may be beneficial in protecting many works, such as an architect's green designs on the source code that is used to implement or track a new environmentally friendly process. However, as copyright protection only extends to the expression of an idea and not to the idea itself, it may be necessary to consider adding other options such as patent or trade secret to best protect an innovative idea.

### 4. Trade Secret

Trade secrets provide another means to protect valuable information. A trade secret can be an idea or information that gains its commercial value because it is not widely known. Protection of a trade secret does not require a government grant—it is established from the time of creation and lasts for as long as the information remains "secret" or otherwise confidential. Trade secrets can be used to keep a wide variety of information from competitors, including business methods, processes, formulas, machines or techniques that provide one organization an advantage over its competitors. Although trade secret protection may be automatic and may be used to protect many things, trade secret protection does not prevent information leakage, independent development, reverse engineering, or later-filed patents once a product is available on the open market. Therefore, although trade secrets offer instant, worldwide protection and may last into perpetuity, trade secrets are not a perfect form of protection.

In the IP world, rights are broadly categorized in the foregoing categories. However, every organization is different and the composition of the IP they acquire will vary accordingly. Thus, in some instances, corporate departments may choose other ways to group the IP assets—often bundled according to the organization's core business. Common IP bundles may include:

- Brand-related assets
- Corporate identity assets

- IP contracts
- IT/Software
- Human capital-related assets
- Patent-related bundles
- Research-related assets
- Other technology related assets

While this list is not exclusive, it provides some instruction on where valuable IP may reside within an organization's structure.

## B. Activities for Protection

Just like there are multiple types of IP protection, each serving an important purpose, there are also multiple activities for protecting IP, suitable for different circumstances.

### 1. Protection

Protection of IP rights usually begins with the process of securing the IP rights. In the case of patents and trademarks, this process involves an application process that may take a year to several years for legal rights to be granted. The application prosecution process may be expensive; however, the investment may eventually pay hefty dividends. Filing an application and receiving the grant of an issued registration generally gives the owner rights superior to subsequent filers or users. Ownership in the case of copyright is established at the time of creation; however, in order to pursue legal action against a suspected infringer, a formal registration must be attained or sought from the Copyright Office. In the case of trade secret protection, although no formal registration is required, if the trade secret is stolen it will be critical to show that the information was well protected and that necessary precautions were taken to limit access in order to maintain the confidentiality of the information.

### 2. Licensing

Licensing involves negotiating an agreement between parties to share certain rights in IP. There are many types of licenses that may be employed to meet the needs of the organization in a particular situation. For example, there are limited licenses, cross-licenses, exclusive licenses, royalty-free licenses, etc.—each designed to accomplish a particular goal.

An organization may choose to take a license on the IP of another or may choose to license out the IP it owns. Regardless of the type of license, the license is usually associated with a fee structure (often royalty payments based on the measured use of the IP) and certain agreed restrictions on use. Licenses are a valuable option to evaluate when considering the objectives of the core business in view of the existing IP portfolio, opportunities for joint ventures, or any deal where corporate valuation is appropriate.



### 3. Transactions

Any transaction that occurs in a business environment is potentially significantly impacted by IP. With an increased focus on the IP assets of a corporate balance sheet, there is also an increased focus on IP rights in financial transactions, such as initial public offerings (IPOs), mergers and acquisitions, bankruptcy matters, and debt offerings. In fact, IP due diligence, including evaluating ownership of IP assets, assignments of IP, rights and obligations under existing agreements, inventory of IP as well as validity of those rights, has become as essential a part of any corporate transaction as traditional due diligence.

### 4. Litigation

Litigation is the adversarial approach to resolving a conflict between parties. While not always the best and most practical strategy to use when seeking IP monetization, it is always an important strategy to consider. Exploring a litigation strategy is a useful practice as it helps to give significant consideration to the range of potential outcomes of the litigation, and also to consider what should be done to appropriately protect IP *ab initio* in order to minimize the potential for defeat or litigation altogether.

Although litigation is necessary in some instances, it may be a cost-prohibitive option as it is both expensive and time-consuming. Further, despite the investment, litigation may still fail to yield the desired results. Thus, prior to expending substantial resources, serious consideration should be given to early settlement opportunities. In situations where litigation cannot be avoided, considerable attention should be given to developing a clear litigation strategy, executing the strategy with efficiency, and analyzing key learning for the future.

To achieve the greatest value, the types of IP and the activities for protection should not be thought of only as independent silos or entities. While each serves a unique purpose or may be used to accomplish a unique goal, the family of IP rights should be blended and considered in its totality—including an analysis of the particular strengths and weaknesses of each in view of the needs of the organization and any gaps that may exist in the existing IP program. Similarly, with respect to the type of IP protection that should be used in conjunction with a given portfolio, each action should also be evaluated in the proper context of the organization's needs.

The IP Matrix illustrates some of the issues that often arise when strategizing the various IP rights along with the common legal actions that are used in connection with protecting those IP rights. Depending on the needs of the organization, one form of protection alone may not yield the most desirable result, and thus the better solution likely will be a combination of various rights protected through various actions.

## IV. Managing and Planning—Practical Tips

Now that there is a general appreciation for the various types of IP and the value they can add to any organization, one should consider practical tips for building, managing and maximizing the value an IP portfolio.

Although there is no such thing as a “magic” portfolio, solid IP that has been thoughtfully developed or strategically acquired and that has been well protected is as close as one can hope. In addition to potentially generating revenue for business, as a standalone a strong IP portfolio can strengthen a negotiation position for the purposes of a licensing deal, initial public offering, merger or acquisition, joint venture, or any other corporate transaction, or for settlement purposes in a contested matter.

### A. IP Ownership Does Not Equate to an IP Strategy— “A Patent Is Not a Patent Strategy”

As previously described, there are many types of IP protection—no one type of IP protection is going to be suitable for every business in every situation. In fact, companies may need to employ a variety of IP rights in order to adequately protect their long-term interests. Importantly, they will need a plan for the actual use of their IP, as merely owning a patent, copyright or trademark may essentially be meaningless unless there is a strategy or plan in place to take full advantage of ownership.

An IP strategy should be comprehensive and tailored to the specific needs of the adopting organization. An ideal IP strategy should include an evaluation of the organization, the present and anticipated needs of the organization, and the strengths and the weakness of each type of IP protection. This is a useful starting point to determine the proper combination of protection options and how to maximize the benefits to the organization. For example, an organization may seek to capitalize on the synergies of integrating trade dress, design patents, copyrights and trade secrets in its IP portfolio, or a company may choose to focus largely on licensing a family of utility patents.

Because of the opportunities, risks and costs that can come with a diverse portfolio, in order to help maximize the growth potential of the IP portfolio an organization should consider employing someone who is trained across the disciplines of the whole IP space to manage this process. Incorporating a person having diverse knowledge in the management of an IP portfolio will be useful in helping to identify potential IP opportunities, handling the necessary prosecution in order to secure the desired IP rights and managing the strategic protection of that IP.

### B. Start at the End: How Will You Use Your IP?

When building an IP portfolio, many organizations have an innovative idea and seek the necessary steps to securing protection of that idea. While this can be benefi-

cial and in many instances lead to acceptable results, it is sometimes a better approach to start with the end in mind to decide what ideas are really worth pursuing. Consider the questions:

- What do we plan to do with this IP?
- How do we plan to use this IP in the future?
- How do we avoid fights about this IP?
- Can we get this IP licensed?
- Does this IP have commercial value?
- How would we win in litigation?

Answering these questions can help to not only clarify the organization's intentions and the business objectives, but also to develop a desired plan of action. Merely accumulating a large IP portfolio without a plan to actually and profitably use the contents of the portfolio to operatively support the needs of the business can be a worthless endeavor. If there is no clear endpoint in mind, or upon an analysis of the proposed end goal the use does not support the objectives of the business, the effort and cost associated with securing the IP may not be justified and further may expose the company to unnecessary risks.

#### **C. Start at the Beginning: Get the Right IP, Efficiently**

Once the organization's end-use objectives are understood, and an appropriate plan to secure the right IP for the needs of the organization is crafted, it is necessary to take an additional step—secure the optimum blend or combination of rights as efficiently as possible.

The cost of securing IP varies depending on the combination of rights to be included in the portfolio. Thus, it is not only important to secure the rights that are most essential to the organization, but also the IP that provides the highest potential for usage and the greatest return on the investment—and to secure those key rights efficiently.

First, set a budget—know what the organization is capable of investing in view of other operational costs and in balance with the value of the potential returns. In times of economic crisis and budget cuts, having a defined budget becomes even more essential. If organizational cuts are necessary, consider what costs are being trimmed and how the cuts potentially affect the bottom line. In an IP context, cutting the funding to a project that may have a high return on investment can have a greater negative impact on the long-term profits of the organization than had a been cut made in an area with a lower potential return. Knowing where to make decreases in costs is always a difficult challenge. In IP, this challenge is made even more difficult by the task of attempting to assign a future uncertain value to a complex asset.

Intellectual property valuation is an intricate process. Intellectual property valuation is an attempt to approximate,

as closely as possible, the quantitative value of a portfolio, incorporating as many relevant factors as possible. There are many ways to attempt to quantify an IP portfolio; some of the more common valuation methods include:

- Liquidation value—the likely value of the asset in the event of a liquidation sale (usually less than the market value);
- Market-based (comparable sales)—the value of the intangible asset as compared with sales of similar assets;
- Cost-based (replacement value)—the estimated cost associated with replacing the intangible asset including development costs such as R&D and IP protections costs;
- Relief from royalty payment or royalty income—valuation based on cost saved on making a royalty payment or income loss from receiving a royalty payment;
- Income or incremental profit—valuation using the incremental income, discounted to present value to estimate the incremental profit; and
- Technology factor analysis—valuation based on a scoring system that takes into consideration a variety of factors and rates the asset based on competitive advantage and utility.

#### **D. Manage the IP Process**

Managing the IP process is also a multi-dimensional effort. Intellectual property management is a combination of at least three core-competencies: 1) knowledge of the relevant scientific or technical field; 2) knowledge of the law; and 3) knowledge of the underlying business. To maximize the potential for building a successful IP portfolio, it is best to identify a manager—more often a team—that is capable of effectively combining each of the essential skills.

An IP manager or Chief IP Officer (“CIPO”) is useful to oversee the IP process and make critical decisions relating to the IP portfolio. The CIPO should chair the IP team and be able to manage the internal, external and regulatory components of the IP portfolio. Specifically, internal management requires:<sup>7</sup>

- Comprehension—the ability to clearly understanding the business strategy and the needs of the business;
- Familiarity with the team—the ability to determine what IP issues will need to be addressed and who in the organization is the proper person to address the issues;
- Foresight—the ability to look for IP opportunities that can support the core business, assessing the

value of IP and making appropriate investment trade-offs (e.g., providing IP based market analysis, competitive insights, technology positioning, financial valuations, inventor recruiting, etc.);

- Preparedness—the ability to identify and address the highest priority needs of the organization to enable the business (not just a singular focus of traditional incorporation of IP);
- Follow-through—the ability to deploy and execute the program for maximum results; and
- Metrics—the ability to identify and create meaningful measuring points that can be used to determine the success of the program.

Externally, the IP manager has the responsibility to promote the organization's IP and successful IP managerial skills, demonstrating the benefits to the company and to the shareholders. An IP officer has the task of maximizing shareholder returns generated through IP, while minimizing the potential for shareholder spoliation lawsuits. Additionally, the CIPO also has the important role of complying with all federal regulations, including those established by SOX and Financial Accounting Standards Board (FASB) reporting requirements. This is especially critical where there is a licensing program that generates income, as successful management of licensed IP rights is essential to maintain the revenue created by the license.

## **E. Invent, Don't Reinvent**

Research and development is both a financial and labor-intensive endeavor. Before considering a new project, understand the goals and objectives of the organization, and also what IP the organization already has possession of or could acquire with relative ease. Generally, this information is attained through an audit. An audit or inventory requires some investment of resources, but if done well, and is properly documented, it can be a very worthy investment.

Further, it is a good idea not only to know the landscape of IP in the organization, but also to have a good idea of what other organizations have done or are doing in the relevant art fields—including not only competitors, but also other parties such as suppliers, customers and universities—with the understanding that maximizing the value of an IP portfolio is not only about what a particular organization is doing, but also about what others are doing in the same space that may potentially positively or negatively affect the long-term value of any acquired IP rights. An understanding of the complete landscape of an IP portfolio, as well as some knowledge of third parties and sound analysis of the current and future markets, provides a useful tool to hone an IP portfolio to meet the needs of the business.

Because an IP portfolio can be used to play both offense and defense in a given technology space, some key points in developing a strong IP strategy are:<sup>8</sup>

- Know what already exists—both internally and externally.
- Search and map a given IP space in order to avoid infringing the rights of another.
- Avoid acts that give rise to liability for willful infringement—which could mean treble damages in the U.S.
- Establish a clear patent position—even if there is no intent to use IP offensively—which may strengthen a defensive position.
- Conduct an IP audit for internal purposes as well as to ensure regulatory compliance.

## **F. Improvements and Alternatives**

Efficient and effective strengthening of the value of an IP portfolio requires attention to the goods and service providers (i.e., an organization and its competitors) as well as a concentrated focus on the consumers in the target market. An IP portfolio that fails at anticipating, and thus subsequently meeting, the needs of the business and its customers, has limited value. If there is no market for the goods or service, it is not possible to generate revenue from direct marketing of those goods and resources nor is there likely to be an interest in licensing deals as a means of generating a revenue stream.

The best way to ensure that an IP portfolio is relevant is to know what has already been done and to anticipate the direction of the field. Ideally this evaluation process will be done quickly and efficiently as there is always an incentive to be the first to invent, first to use, or first to market. Therefore, in many instances it will be beneficial to pursue protection of IP interests as soon as they are sufficiently developed so that others must invent and create around your IP.

## **G. Levels of Value**

Every potential IP option may not be a viable option worth pursuing for every organization in every situation. Again, knowing the business goals and objectives provides an invaluable road map to determining which IP is worth the time and financial investment of securing. One mistake that many organizations that seek to substantiate their IP portfolio make is to assume more IP is better. A large portfolio does not automatically equate to a quality portfolio, i.e., a potentially profitable portfolio. Further, while broad rights in a portfolio provide art that may be difficult to design around and thus not easily breached, broad rights also create costs, the potential for antitrust attacks and a larger target for potential invalidity actions.



Thinking of an IP strategy in at least four levels can help to determine what IP is worth including in an IP portfolio. On the first level is the above-mentioned large portfolio and the concept of securing IP rights. As previously discussed, there are several forms of IP protection that may be used to secure rights in a given innovative technology or idea. Further, adequate protection may be in the form of any single form of protection or coverage by a combination of IP rights.

Once the rights have been secured, there is a second level of protection. This level considers the scope or breadth of the IP rights as well as the validity of those rights. It is important to understand exactly what the organization has acquired rights in and where the boundaries of those IP rights lie. Having this knowledge is key to identifying potential infringements as well as to prevent infringing on the rights of another.

This is also relevant in consideration of the third level, which includes consideration of freedom-to-operate, also known as right-to-use. Freedom-to-operate is always critical not only when considering the overall IP strategy and how the IP can and will be used in support of the business objectives, but also the value that can be assigned to the IP. Intellectual property with significant limitations on use will be less valuable than valid IP with fewer limitations on the right-to-use.

On the fourth level, the value of the IP will be impacted by the available alternatives. A portfolio covering innovations in a field where multiple alternatives already exist in the public domain, or are easily licensed through other sources, will substantially limit the value of those innovations.

The four levels of IP are useful in evaluating the complete IP picture. The levels help to clarify foreseeable uses or roadblocks to uses of the IP. Careful attention and planning regarding each level will increase the opportunities for building value in the IP portfolio. Specifically, asking probing questions regarding the particular IP is likely to provide a well-reasoned rationale for selecting which IP to pursue or to maintain in the portfolio rather than operating without such directed thought. Some helpful questions to consider are:

- Is the patent infringed or likely to be infringed?
- Is this IP that can or should be licensed? Who might need a license? How receptive are targets to licensing?
- How strong is the IP?
- What IP is similar?
- What potentially invalidating art exists?
- How solid is the prosecution history?
- If necessary, how much would it cost to prove infringement in litigation?

## H. The IP Cycle

Developing good IP and a strong IP portfolio is not a single event, but instead, it is process that requires dedication at each stage.

The science and technology fields relating to cleantech are rapidly evolving and therefore it is critical to keep atop of the market and trends and to continue to build an appropriate and relevant portfolio. The constant evolution of the market and consumer needs creates a moving target accentuating the importance of revisiting the IP protection and portfolio management strategy. As the needs of the business change and evolve, it is necessary to ensure the IP portfolio and management thereof stay at least in lock-step, if not ahead of the changing needs of the business and consumers. Again, regular evaluations and reevaluations of the program based on meaningful metrics are the best way to achieve the ultimate goal of IP ownership—creating value for the business that justifies the investment.

## V. Tough Times—Prioritization for Maximization

There is always a limitation on resources—perhaps now even more than other times. In the really tough times, it is even more necessary to guard against unnecessary or wasteful use of resources. In these times, it is necessary to approach the IP management process using triage methods.

The triage process can be an effective means of prioritizing the management task in order to focus on those activities or specific assets that offer the greatest financial viability. For example, where an organization is in possession of a substantial IP portfolio, instead of analyzing and reviewing the entire portfolio, it may choose to at least do a “quick” review, focusing on a few areas that are either fundamental to the core business or that have the greatest potential for a high return on investment. This review could be done in-house to minimize the cost and, e.g., in a patent context, usually involves reading the title and abstract and some or all of the claims. Evaluating the current direction of the business and the business needs or focusing on high-risk IP—i.e., patents that may read on existing products or IP that is no longer essential to the fundamental operation of the business—are other criteria that can be used to determine triage order.

As with any prioritization process, the organization should begin the effort by addressing the most important and key tasks (e.g., auditing to comply with reporting requirements) and assets (e.g., staying current with maintenance fees on a patent for a top-grossing product), working backward to accomplish important tasks, but not necessarily critical to the current business or practical given the limitation on resources. Identifying the organization’s top priorities and approaching the IP management through triage yields acceptable results in most situations.

## VI. Cleantech Challenges

Protecting IP can provide many unique challenges. These challenges are further accentuated when applied within the realm of clean and green technologies. Green fields often incorporate a complex mix of interdisciplinary skills and technologies, making the innovative process difficult to categorize in the traditional technology fields. In addition to the mix of technology, there are unique incentives to disclose innovations and to encourage collaboration, different than in most other fields. Because of the overarching goals of environmental protection, there are incentives to simplify the process of securing IP protection in order to expedite the distribution of this technology. There are also incentives to cut the cost and complexity of negotiating access to innovative advances and to promote collaboration.

Collaboration regarding new ideas, while useful, often leaves the question of IP ownership and allocation of risks unclear. Several technology-sharing models have been created in an effort to combat these challenges. Some of the common models include:<sup>9</sup>

- Patent pools—participating patent owners agree to license their technologies to one another. An open patent pool would enable access by any party to the technology, while a closed pool would restrict access.
- Patent commons—allow technology holders to pledge patented technology for widespread use for no royalty payment. This is usually subject to certain conditions.
- License of right—some countries offer a reduction in official fees for patent owners in exchange for making licenses available to anyone requesting, subject to terms negotiated by a governing body.
- Non-assertion pledge or covenant—patent holders may make their IP openly available by agreeing not to assert their rights against anyone making use of their technology.
- Humanitarian licensing—provides use of technology for certain beneficiaries and social programs.
- Public domain—placing technology directly in the public domain so technologies may be freely used without legal constraint.
- Open innovation or open source—innovation model that emphasizes collaborative or shared technology platforms for innovation.

All of these models are useful and may be employed to encourage the collaborative spirit of accomplishing the overarching goals of green technologies—improving environmental conditions.

Greentech and cleantech fields provide substantial opportunities for technology advancement, IP development,

and corporate value growth. The key to maximizing the potential for IP value in this field is an understanding of the business objectives and building an IP management strategy that supports those overall goals. While it is necessary to invest in the IP portfolio, a solid strategy can help an organization to identify and focus its resources on those areas that have the potential to yield the greatest returns.

## Endnotes

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## PROTECTING CREATIVITY: RIGHTS & ACTIONS

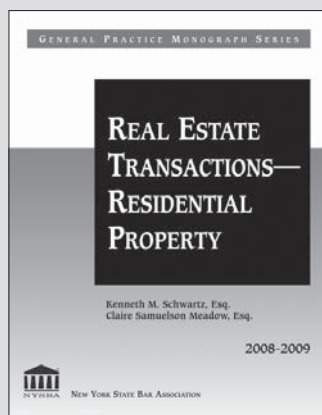


	PATENT	TRADE SECRET	TRADEMARK	COPYRIGHT
<b>PROTECTION</b>	<ul style="list-style-type: none"> <li>• A patent is not a patent strategy</li> <li>• <b>Strategize:</b> patent/trade secret/publish</li> <li>• <b>File:</b> easily, often, triage, provisional</li> <li>• <b>Tips:</b> CIPs, Pre-Appeals</li> <li>• <b>Basics:</b> written assignments</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Covers:</b> almost anything confidential (state law dependent)</li> <li>• <b>Risks:</b> reverse engineering; inadvertent loss; creator owns absent written assignment</li> <li>• <b>Tips:</b> reasonable safeguards</li> <li>• <b>Basics:</b> written policy/procedures; NDA/CDA; MTA</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Use:</b> indicates source not description of goods/services</li> <li>• <b>Key:</b> search before using/adopting mark</li> <li>• <b>Consider:</b> foreign registrations, relevant markets, future growth</li> <li>• <b>Best:</b> use arbitrary/fanciful terms</li> <li>• <b>Basics:</b> file Intent to Use; retain first use evidence; keep press coverage</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Covers:</b> original expression, not ideas</li> <li>• <b>Consider:</b> benefits of notice &amp; registration</li> <li>• <b>Also:</b> minimal creativity expressed in tangible medium</li> <li>• <b>Can be:</b> software, devices product inserts, ads, images, containers</li> <li>• <b>Also:</b> databases; DMCA</li> </ul>
<b>LICENSING</b>	<ul style="list-style-type: none"> <li>• <b>Don't:</b> simply sell or buy; license</li> <li>• <b>Patents and applications:</b> can license both in or out</li> <li>• <b>Do:</b> define &amp; use fields</li> <li>• <b>Consider:</b> minimum sales and timed royalties</li> <li>• <b>Be wary:</b> insolvency outs; evergreen deals</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Identify:</b> trade secret/individuals with access</li> <li>• <b>Limit:</b> time for teaching</li> <li>• <b>Sign Up:</b> get signed NDA's and non-competes</li> <li>• <b>Tips:</b> prohibit reverse engineering; provide termination</li> <li>• <b>Terminate:</b> if 3<sup>rd</sup> party reveals secret</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Verify Validity:</b> filings, fees and use</li> <li>• <b>No:</b> naked assignments; always transfer good will</li> <li>• <b>No:</b> naked licenses; quality control is essential; include audit rights</li> <li>• <b>Consider:</b> termination/reversion if misuse or "weak" use</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Basics:</b> impose conditions, restrictions</li> <li>• <b>Always:</b> license software &amp; databases, even if no fee</li> <li>• <b>Limit:</b> co-authors' right to license/gift</li> <li>• <b>Can:</b> license different rights to different people</li> <li>• <b>Should:</b> reserve rights &amp; analyze international issues</li> </ul>
<b>TRANSACTIONS</b>	<ul style="list-style-type: none"> <li>• <b>Try before you buy:</b> due diligence</li> <li>• <b>Title:</b> search federal &amp; state UCC liens</li> <li>• <b>Delve:</b> inventor notebooks, outside consultants/contributors</li> <li>• <b>Beware:</b> 3<sup>rd</sup> party patents; Freedom to Operate; Right to Use</li> <li>• <b>Obtain:</b> assignments for all rights in product (when buying)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Inventory:</b> list secrets; include customer list</li> <li>• <b>Investigate and Audit:</b> status/validity, notice, access</li> <li>• <b>Examine:</b> relevant MTAs, CDAs, employee agreements, licenses</li> <li>• <b>Prove:</b> ownership; assignment; validity</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Verify Validity:</b> due diligence</li> <li>• <b>Focus on:</b> licensees, users</li> <li>• <b>Use:</b> evidence of first use &amp; monitoring evidence</li> <li>• <b>No:</b> naked transfers or licenses</li> <li>• <b>Beware:</b> TM is not IP under special bankruptcy rules</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Retain:</b> royalty-free license (when selling)</li> <li>• <b>Obtain:</b> assignments for all copyrights in product (when buying)</li> <li>• <b>Co-Authors:</b> split equally unless contrary written agreement</li> <li>• <b>Purchase:</b> financing; security interest; perfection</li> </ul>
<b>LITIGATION</b>	<ul style="list-style-type: none"> <li>• <b>Strategize before suing:</b> due diligence</li> <li>• <b>Basics:</b> title, inventorship, validity</li> <li>• <b>Remember:</b> your own patents do not protect you from infringement suits</li> <li>• <b>Alternatives:</b> reexamine; EPO opposition</li> <li>• <b>Themes:</b> a human interest story of justice to make complexity come alive</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Prove:</b> existence, ownership, access, notice, use &amp; damages</li> <li>• <b>Tip:</b> Often no "work for hire" rule</li> <li>• <b>Misappropriation:</b> prove access, notice, use</li> <li>• <b>Don't:</b> perfect the theft by disclosing via suit</li> <li>• <b>Criminal also:</b> Economic Espionage Act of 1996</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Required:</b> use it or lose it</li> <li>• <b>Enforce:</b> aggressively under state or Federal law</li> <li>• <b>Monitor:</b> US and world applications; oppose if potentially harmful</li> <li>• <b>Swiftly:</b> use TROs and preliminary injunctions</li> <li>• <b>Tips:</b> trade dress, altered goods</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Actionable:</b> paraphrasing, if copied structure, sequence &amp; organization</li> <li>• <b>Defenses:</b> fair use; work for hire</li> <li>• <b>Tip:</b> have all rights assigned, future media</li> <li>• <b>Possible:</b> to aggressively prevent competitor from displaying copyrighted product</li> </ul>



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## Recent Decisions in Environmental Law

### ***Burlington Northern and Santa Fe Railway Company v. United States*, 07-1601 (2009)**

#### **Facts**

In 1960, Brown & Bryant, Inc. (B&B) started operating an agricultural chemical distribution business, which purchased pesticides and other chemicals from suppliers such as Shell Oil Company (Shell) in Arvin, California. In 1975, B&B leased adjacent land from Burlington Northern and Santa Fe Railway Company (Railroads). During its operation, B&B arranged with Shell for delivery of chemicals such as Nemagon, D-D, and dinoseb, which frequently spilled onto the ground during the transfer process. Despite Shell's encouragement of safe handling of its products, these spilled chemicals seeped into the soil and contaminated the groundwater.

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)<sup>1</sup> to promote the timely cleanup of hazardous waste sites and to ensure that parties responsible for the contamination bore the costs of such cleanup efforts. In 1983, the California Department of Toxic Substances Control and the Environmental Protection Agency (Governments) began investigating the site and by 1998, they had spent more than \$8 million cleaning it up, after B&B became insolvent in 1989. In 1991 the EPA issued an administrative order, directing the Railroads to help remediate the site, since they were the owners of a portion of the property on which the Arvin facility was located. The Railroads did so, incurring more than \$3 million in expenses. They then brought an action against B&B in 1992, which was later consolidated with two recovery actions brought by the Governments against Shell and the Railroads.

The District Court held that both the Railroads and Shell were potentially responsible parties (PRPs) under CERCLA, and that the harm to the site was divisible and capable of apportionment. The Railroads were found responsible because they were owners of a portion of the facility<sup>2</sup> and the Court apportioned their liability as 9% of the Governments' total expenses. The basis for this apportionment was the percentage of the total area of the facility that was owned by the Railroads, the duration of B&B's business on the leased property, and the determi-

nation that only two of the three chemicals were responsible for about two-thirds of the overall site contamination. Because it had "arranged for" the disposal of hazardous materials through its sale and delivery of the chemical D-D,<sup>3</sup> Shell's liability was apportioned as 6% based on the estimations of chemical spills of Shell products.

The Governments appealed the District Court's apportionment and Shell cross-appealed the Court's finding of liability. The Court of Appeals ruled that although Shell did not qualify as a "traditional" arranger,<sup>4</sup> since it had not contracted with B&B to directly dispose of a hazardous product,<sup>5</sup> it could still be held liable under a "'broader' category of arranger liability" if the "disposal of hazardous wastes [wa]s a foreseeable byproduct of, but not the purpose of, the transaction giving rise to" arranger liability.<sup>6</sup> The Court of Appeals relied on CERCLA's definition of "disposal," which covers "leaking" and "spilling,"<sup>7</sup> to conclude that Shell could have arranged for "disposal" "even if it did not intend to dispose" of a hazardous substance through its sale and delivery of D-D.<sup>8</sup> Although the Court of Appeals did not dispute the determination that the harm caused by Shell and the Railroads was capable of apportionment, it nevertheless concluded that the District Court erred in finding that the record clearly established a reasonable basis for apportionment, reversing the District Court's apportionment liability and holding Shell and the Railroads jointly and severally liable for the Governments' costs of cleaning up the contamination.

#### **Issues**

Whether Shell was properly held liable as an entity that had "arranged for disposal" of hazardous substances within the meaning of § 9607(a)(3), and whether Shell and the Railroads were properly held jointly and severally liable for all response costs incurred by EPA and the State of California.

#### **Reasoning**

The U.S. Supreme Court first analyzed the issue of whether Shell arranged for the disposal of hazardous chemicals. CERCLA imposes strict liability for environmental contamination upon PRPs and compels them to clean up a contaminated area or reimburse the Govern-

ment for its clean-up costs.<sup>9</sup> The Railroads qualify under both §§ 9607(a)(1) and 9607(a)(2) as PRPs because they owned the land leased by B&B. The Court looked at the plain meaning of the verb “arrange” in § 9607(a)(3) to determine whether Shell may be held liable as an arranger. The Court concluded that the word “arrange” requires intentional action and that the statute would apply only to an entity that enters into a transaction for the sole purpose of discarding a used hazardous substance, not to an entity that merely arranges for the delivery of a new and useful product.<sup>10</sup> Even though Shell knew of spills that occurred on the site, the Supreme Court ruled that knowledge alone was insufficient to prove that Shell intended for the disposal of hazardous materials at the site. Thus, the U.S. Supreme Court found that Shell was not liable as an arranger for the contamination that occurred at B&B’s Arvin facility.

Next, the Court examined whether the Railroads were properly held jointly and severally liable for the full cost of the Governments’ expenses. The Supreme Court began with the assertion that in CERCLA, Congress intended the scope of liability to be determined from common law,<sup>11</sup> found in § 433A of the Restatement (Second) of Torts.<sup>12</sup> Apportionment is proper when “there is a reasonable basis for determining the contribution of each cause to a single harm.”<sup>13</sup> When two or more causes produce a single, indivisible harm, “courts have refused to make an arbitrary apportionment for its own sake, and each of the causes is charged with responsibility for the entire harm.”<sup>14</sup>

However, in this case neither the District Court nor the Court of Appeals disputed the fact that the harm created was capable of apportionment. Rather, the issue was whether the record provided for a reasonable basis for the District Court’s apportionment.

The Supreme Court held that joint and several liability should not be imposed in a Superfund action where a reasonable basis for apportionment exists, and the facts contained in the record reasonably supported the apportionment of liability. The District Court’s findings support the conclusion that the primary pollution at the Arvin

facility was contained in the southeastern portion of the facility most distant from the Railroads’ parcel and that the spills of hazardous chemicals that occurred on the Railroads’ parcel contributed to no more than 10% of the total site contamination. Thus, the Supreme Court concluded, it was reasonable for the District Court to use the size of the leased parcel and the duration of the lease in its determination of apportionment liability.

## Conclusion

The U.S. Supreme Court ruled that the Court of Appeals erred by holding Shell liable as an arranger under CERCLA for the costs of the remediation of the environmental contamination at the Arvin, California facility. Furthermore, the Court concluded that the District Court reasonably apportioned the Railroads’ share of the site remediation costs at 9%.

Nadya Kramerova, 2009

## Endnotes

1. 42 U.S.C. §§ 9601-9675 (1980).
2. See 42 U.S.C. §§ 9607(a)(1)-(2).
3. See 42 U.S.C. § 9607(a)(3).
4. *Id.*
5. *U.S. v. Burlington Northern & Santa Fe Ry. Co.*, 520 F.3d 918, 948 (2008).
6. *Id.*
7. 42 U.S.C. § 6903(3).
8. 520 F.3d, at 949-50.
9. See *Cooper Industries, Inc. v. Aviall Services, Inc.*, 543 U.S. 157, 161 (2004).
10. See *Freeman v. Glaxo Wellcome, Inc.*, 189 F.3d 160, 164 (1999); *Florida Power & Light Co. v. Allis Chalmers Corp.*, 893 F.2d 1313, 1318 (1990).
11. *United States v. Chem-Dyne Corp.*, 572 F.Supp. 802, 808 (1983).
12. *United States v. Hercules, Inc.*, 247 F.3d 706, 717 (2001); *Chem-Nuclear Systems, Inc. v. Bush*, 292 F.3d 254, 259 (2002); *United States v. R. W. Meyer, Inc.*, 889 F.2d 1497, 1507 (1989).
13. Restatement (Second) of Torts § 433A(1)(b), p. 434 (1963-1964).
14. Restatement (Second) of Torts § 433A, Comment *i*, p. 440 (1963-1964).

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