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The New York Environmental Lawyer

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

Inside

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Message from the Chair

Howard M. Tollin

Thank you for the honor and privilege to help lead our Section. As incoming EELS Section Chair, my priorities include implementing various initiatives started by our past Chairs as will be discussed herein. EELS members, please bring your ideas, enthusiasm, and even constructive criticism to me and our officers. My interactions with fellow EELS members have been rewarding in many ways: witnessing the dedication to help our environment; watching your involvement with non-profit groups on environmental and energy issues; learning from you at seminars and from your published articles; understanding your business practices; seeing you help each other professionally and personally; and spending time together to help our Section grow and prosper.

EELS will continue to provide the most current environmental updates, practical education, fun, and networking opportunities. I believe that our Fall Meeting at the Mohonk Mountain House, Co-Chaired by Michael Bogin and Susan Amron, provided all the mentioned opportunities—as did the recent Oil Symposium on May 8, and the Legislative Forum on June 13, so will the upcoming Brownfield Symposium on December 12, and Annual Meeting on January 31. We are being mindful of speaker guidelines on diversity as we coordinate programs.

Many of you already work behind the scenes, which we appreciate. There are more than two dozen important substantive committees as well as committees of individuals who volunteer on membership, social media, nominations for officers and executive committee, minority fellowship, *TNYEL* journal editors and contributors, essay contest judges, Section awards, and program chairs and panelists. Thank you to everybody who has assisted and currently assists our Section, and congratulations to our Section award winners for your well-deserved recognition. Financially, EELS is in excellent shape due to our pursuit of program sponsors, for which we request your continued assistance.

Lisa Bataille, our Section Liaison, has worked diligently for many years to coordinate our Section's activities and always is consistently reliable and supportively helpful. The most recent officers, Larry Schnapf, Kevin Bernstein and Marla Wieder, with whom I've worked closely the past four years, are truly incredible people, leaders, and trusted mentors. We should also be proud of our current dynamic and enthusiastic officers: Vice-Chair Nick Ward-Willis, Treasurer Linda Shaw, and Secretary Jim Rigano. Working with these officers will be fun and productive as we have interacted together professionally and socially since the early 1990s.

Looking back, Miriam Villani, as Chair in 2005, elevated my Section involvement when she named me a Co-Chair of Membership. Miriam also added Membership as a topic to monthly cabinet calls and Executive Committee meetings, which we continue to do. My participation on monthly cabinet calls continued as the Section's Delegate to NYSBA's House of Delegates. Those calls, which often run over an hour, result in creative brainstorming of new ideas as well as the practical implementation of programs. As part of the Executive Committee and Cabinet for those 14 years, it was also a privilege to collaborate with honorable and hardworking past Section Chairs Walter Mugdan, Lou Alexander, Joan Leary Matthews, Alan Knauf, Barry Kogut, Phil Dixon, Carl Howard, Kevin Reilly, Terresa Bakner, and Michael Lesser. Other former Chairs also continue to take on challenges on behalf of our Section such as Gail Port, Dan Ruzow, John Greenthal, Jim Periconi, and Ginny Robins. Thank you all for enriching my life in many ways, and for continuing to be so active in our Section.

One ongoing initiative that is particularly important to our Section is growth and retention of membership. Please consider **volunteering to be part of a membership committee** with its goals to locate more in-house corporate environmental lawyers, energy lawyers, and eager law students; mentoring of younger lawyers; and assistance with contacting our dropped non-renewed members. We are still utilizing the results of 118 SurveyMonkey responses in 2016, in which EELS members volunteered to be a mentor and/or host a function at their law firm.

Over the past few years, we have evaluated and discussed the activities of Committees and have changed several Co-Chairs. All active Co-Chairs were confirmed for a four-year term beginning on June 1, 2017, and ending June 1, 2021. This process will continue over the year as will the adding of EELS members to Committees. We have active social media and communication chairs, and we will be adding new technologies for webcasting live programs and using webinars to make EELS programs more convenient and accessible. Our FFEP Task Force continues to meet with regulators and involve EELS in the ongoing policy dialogue about the federal legislative and decision-making process.

The full Cabinet, who will assist me monthly with EELS activities, presently includes: Lisa Bataille, Chief Section Liaison; Nick Ward-Willis, Vice-Chair; Linda Shaw, Treasurer; Jim Rigano, Secretary; Terresa Bakner, Section Counsel; Amy Kendall, House of Delegates;

Meaghan Colligan, Drew Gamils and Rachel Partington, Social Media; Rob Stout, Membership; and Miriam Villani, *TNYEL* Editor-in-Chief.

An area of interest which EELS should continue to monitor is emerging contaminants and environmental claims. Examples are Perfluroalkyl substances (PFAs), 1,4- Dioxane, pesticides, and cannabis. Perfluoroalkyl substances (PFAs) include perfluorooctanoic acid (PFOA) and perfluorosulfonic acid (PFOS) as part of a large class of widely used chemicals containing fluorine that appear and are toxic to the environment, animals and people. PFAs do not occur naturally, and result from manufacturing, industrial and consumer uses and disposal activities. The consumer products that were a source of PFAs included grease-resisted paper, fast food wrappers, microwave popcorn bags, pizza boxes, and candy wrappers; non-stick cookware such as Teflon coated pots and pans; Scotchguard used on carpets, fabrics and upholstery; personal care products including shampoo and dental floss; cosmetics such as nail polish and eye makeup; water-resistant clothing and Gore-Tex; and paints, varnishes, and sealants.

PFAs are extremely resistant to environmental degradation, thus persisting in soil, water, food, and dust. Drinking water has become a huge concern for communities because the water supplies are contaminated with PFAs. Human and animal studies have confirmed PFAs cause several cancers, developmental and early childhood problems, including low birthweight, liver effects, skeletal variations, thyroid abnormalities, ulcerative colitis, cholesterol changes, and testicular and kidney cancers. Effects on children further include effects on renal function, asthma, mammary gland development, and menstruation. The maximum contaminant levels (MCLs) for PFAs are being studied and recommended below 70 parts per trillion (ppt), which is much more stringent than other frequent chemicals of concern such as polychlorinated biphenyls (PCBs) which is 5,000 parts per trillion (ppt), and benzene which has an MCL of 5,000 ppt for drinking water. New York State may seek 10 ppt as the standard.

PFAs are a large group of man-made chemicals that have been used since the 1950s. While the use of some of these chemicals decreased in the United States over the past decade, most people are exposed because the chemicals are prevalent in the environment. PFAs do not break down easily in the environment and build up in the bodies of humans and animals. At some juncture, PFAs will need to be regulated by the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1,4-Dioxane similarly is a human carcinogen that has been found in groundwater at sites throughout the United States and does not readily biodegrade in the environment. 1,4-Dioxane was used regularly as a stabilizer in certain chlorinated solvents, paint strippers, waxes, greases, antifreeze, aircraft de-icing, and in some consumer products such as deodorants, shampoos, and cosmetics. Traces have been found in food supplements from packaging adhesives and an ingredient in pesticides on food crops. 1,4-Dioxane is frequently present at sites with 1,1,1-trichloroethane (TCA) contamination. While no present federal MCL has been established, 1,4-Dioxane is included in the Third Unregulated Contaminant Monitoring Rule as a drinking water contaminant. Thus, regulatory agencies and government officials at all levels are beginning to evaluate and regulate this toxic contaminant.

Cannabis present some environmental dilemmas and is a topic that will continue to generate news coverage over the next year. The Federal Drug Enforcement Agency, has cannabis scheduled as a Schedule 1 Drug, which means no beneficial use is recognized. As such, federal criminal law prohibits the manufacturing, possession, or distribution of marijuana as a Schedule 1 narcotic. However, there are 30 states and Washington, D.C. which have adopted some form of legalization of cannabis and medical marijuana. State legislation is likely to continue in 2019, allowing cannabis uses, and corporate investment in the cannabis industry is in the billions, including large companies like Coca-Cola, Scotts Miracle-Gro, and Constellation Brands.

Pesticides are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) pursuant to 7 USC § 136. As a Schedule 1 Drug, cannabis is not allowed to be listed as a target crop on a registered pesticide label. Thus, no registered pesticides are legal to apply to cannabis. This is problematic because the large commercial greenhouses and converted warehouses face normal pest pressures of insects and disease and require the use of fungicides and insecticides.

Some states like Colorado, Oregon, and Washington have published criteria on best practices for acceptable pesticide products. The New York State Department of Health sought approval from the New York State Department of Environmental Conservation (NYSDEC) on acceptable pesticides, but NYSDEC failed to publish a list of any acceptable products. New York requires analysis for 66 known pesticide active ingredients for acceptable residue, but none have been expressly approved for cannabis. In addition to pesticide regulation, solid waste management in all states requires shredding of cannabis waste to make it unrecognizable and tracking by disposal event. Depending on the growing media, large quantities of heavy metals have been detected as another environmental concern. Hence, pesticides and other toxins are already being used on this crop with little knowledge, care, or oversight.

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Message from the Issue Editor

Alicia Artessa

First and foremost, my name is Alicia Artessa and I am honored to join *The New York Environmental Lawyer* team as an issue editor. I look forward to working with *TNYEL* editorial team and am happy to write about the exciting new changes in environmental and energy law here in New York.

The New York State legislature finally came to a consensus on meaningful climate change legislation in June, after years of infighting between the houses over one bill in particular, the Climate and Community Protection Act. The legislative process in New York is not necessarily as straightforward as it may seem. Typically, for more controversial bills, staff attorneys from each house of government meet to negotiate all aspects of the proposal. Thus, the eventual Climate Leadership and Community Protection Act (CLCPA) was negotiated between the legislative and executive branches night and day during the last weeks of this year's legislative session. Once implemented, the CLCPA will be one of the most ambitious climate change mitigation policies in the world. However, did the Senate and the Assembly inadvertently sign over all environmental authority to the Governor the moment the bill was signed?

The new law requires a reduction in statewide greenhouse gas emissions to 60 percent of 1990 levels by 2030 and 15 percent of 1990 levels by 2050. It also includes significant provisions related to environmental justice communities, notably including an air quality monitoring program. The law requires a Renewable Energy Program (REP) must be created by 2021. The REP must be designed to ensure that at least 70 percent of statewide electric generation comes from renewable energy systems by 2030, and that by 2040 the electrical system must have "zero emissions" or be carbon neutral.

Importantly, the CLCPA explicitly defers these lofty goals to be regulated almost entirely by various executive agencies. First, because the language of the bill does little to specify how the state will achieve the emissions reductions goals, it created a working group to hammer out the details. The Climate Action Council (Council) is tasked with creating reports, proposals, and a scoping plan to implement the overarching policies set forth in the legislation. The Council is to be co-chaired by the Commissioner of the New York State Department of Environmental Conservation (NYSDEC) and the President of the New York State Energy Research and Development Authority (NYSERDA)—two of the most powerful executive agencies.

The Council is comprised of 20 additional members from various other executive agencies and authorities. They are appointed as follows: two non-agency members appointed by the Governor, three members appointed by the Temporary President of the Senate, three appointed by the Speaker of the Assembly, one appointed by the Minority Leader of the Senate, and one appointed by the Minority Leader of the Assembly.

Effectively, this structure puts the head count at eight members appointed by the legislature and 14 appointed by the Governor. The Governor appoints almost double the number of stakeholders in the group that is charged with shaping and enforcing the climate change and renewable energy policy of the state.

The CLCPA also defers significant authority to NYSDEC. First, the law requires that NYSDEC issue annual reports on statewide greenhouse gas emissions. Next, within four years, NYSDEC is required to promulgate regulations to ensure compliance with the statewide emissions reduction limits and assist other state agencies in promulgating their own regulations, as necessary, to achieve these limits. The regulations are to "reflect, in substantial part, the findings of the scoping plan" that the Council is required to report. Therefore, NYSDEC not only has significant authority to enforce compliance but the only codified check on that authority comes from the executive-heavy Council. Further, the CLCPA defers considerable authority to the Public Service Commission (PSC), another powerful executive agency. In New York, the PSC is the final arbiter regarding regulatory enforcement in the energy sector. Now that power is expanded into policy making. The PSC is tasked with creating the aforementioned Renewable Energy Program by 2021. Therefore, the law mandates renewable energy benchmarks but gives all jurisdiction to the PSC to create and enforce that policy.

The PSC has seemingly embraced this duty without haste, implementing a new proceeding in early August to examine wholesale energy markets to ensure "resource adequacy" in light of the "newly-imposed energy goals."

Ultimately, the Governor now has the controlling legal authority on all pertinent aspects of climate change and renewable energy policy in the state. So what? Arguably, with the previously divided legislature, the Governor and his agencies were already the leading voices in environmental policy and the state had been faring well.

However, it is important to note that with the Senate's and Assembly's acquiescence via the Climate Leadership and Community Protection Act, legislators cannot criticize the Governor for acting as an environmental demagogue — because they gave him permission. After all, they even let him change the name (formerly the Climate and Community Protection Act).

Alicia Artessa

Note from the Editor-in-Chief: Alicia Artessa is joining the editorial staff of *The New York Environmental Lawyer* as Justin Birzon moves on to other exciting projects. Alicia is a Government Relations Associate with the Retail Council of New York State and a licensed New York State attorney. She previously spent two years as an Assistant Counsel in the New York State Senate specializing in environmental and energy law. Alicia graduated *cum laude* from Vermont Law School with a Juris Doctor degree and a Master of Environmental Policy degree. During her time at Vermont Law, she was an editor on the Vermont Law Review and had her work published in the *Willamette Environmental Law Journal*. Alicia spends her spare time hiking with her labradoodle, Spencer, drinking Vermont beer, and traveling internationally.

Message from the Chair continued from page 5

Emerging environmental contaminants often result in unsafe drinking water. The Flint, Michigan water crisis from lead contamination was one of the more significant news stories about how everyday practices and products can impact the water we drink and our health. In New York, PFAs are impacting public water supply systems and private drinking wells in communities all over the state including Hoosick Falls, Petersburgh, Newburgh, and Long Island. New York recently listed PFOA and PFOS as hazardous substances and will likely be setting state maximum contaminant levels within the next year.

At the Gabreski Air National Guard Base, there is an on-going investigation to identify all sources of PFOS contamination and private residences were required to connect to public water, with the Federal Government reimbursing Suffolk County for the costs. New York State further sued the manufacturers of aqueous film-forming foam (AFFF) in then NYS Supreme Court and filed a Notice of Claim against the U.S. Department of Defense concerning the use of AFFF at Stewart ANG Base, Gabreski Airport, and Long Island MacArthur Airport. AFFF, now deemed hazardous, was regularly used in firefighting foams.

We had our first meeting to plan the EELS 2020 Annual Meeting, "Risky Business," Co-Chaired by George Rusk, Cheryl Vollweiler, and Michael Hecker. EELS will be addressing emerging contaminants at that meeting and you will receive updates throughout the year.

In closing, it was helpful to re-review our current EELS mission statement: "The purpose of this Section shall be to bring together such members of the New York State Bar Association as are interested in environmental, land use, energy, health and safety, and related issues and topics, to further the education of the legal community, the public, and governmental and elected officials on legal, administrative, and policy matters relating to such issues, to facilitate the making of public policy, and to provide networking opportunities between and among attorneys in private practice, government, corporations, and consulting firms."

Reach out to me anytime via e mail, or call with your thoughts and suggestions.

Best,
Howard Tollin
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Message from the Student Editorial Board

Much like the climate, the nature of environmental law is changing. This is a field constantly in flux out of necessity—our environment, and our understanding of it, exists in a state of dynamic equilibrium. The practice of law, especially as it relates to the environment, is similarly always adjusting to new realities. The Climate Leadership and Community Protection Act, passed by New York at the end of the 2019 legislative session, is just one example of such an adjustment.

At least 33 states have passed such laws, and municipalities across the country have taken action at the local level as well. Earlier this year, New York City passed the Climate Mobilization Act which, among other things, requires buildings in the city to collectively cut their emissions by 40 percent by 2030 (which will help New York State meet its goal of a 60 percent emission reduction within the same time frame). These new laws often require the promulgation of new regulations and will surely be subject to mountains of litigation. A recent report by the Sabin Center for Climate Change Law at Columbia Law School found that there were 159 cases that raised climate change as an issue of fact or law in 2017 and 2018.

The timeline included in the Climate Leadership and Community Protection Act (and other legislation like it), and the time frame of the anticipated impacts of climate change, highlight two important truths: much of the responsibility for countering climate change and many of the burdens borne of it will fall on the next generation—and yet the urgency of the need for action is real and immediate. As the bill notes, the U.S. Global Change Research Program and the International Panel on Climate Change have indicated that industrialized countries will need to reduce emissions by 80 percent below 1990 levels in order to limit warming to below 2 degrees Celsius. United Nations scientists have said that there may be only 11 years left to act and limit the most severe consequences of climate change.

A generation of young activists have recognized the urgency of the threat, as shown by the roughly 1.4 million students who participated in school walkouts and strikes earlier this year to demand action from their governments and political leaders. While the federal government recently reiterated its intention to withdraw from the Paris Agreement at the G20 summit in Osaka, Japan, New York and other states around the country have acted at home. Now that New York's leaders have taken some of the first steps of such action, it will be up to another set of leaders to see it through: environmental lawyers, both already practicing and newly minted.

Lawyers will consult on, shape, and write new regulations that will be the backbone of legislation such as the Climate Leadership and Community Protection Act. Lawyers will defend such legislation from the inevitable challenges it will face. Lawyers will innovate, apply, and adjust the approach of law as we continue to learn about the scope and direction of climatic changes. To adequately do so, we will need to adapt to the new realities of a changing natural and legal environment.

David Dickinson

Message from the President

Diversifying the Legal Profession: A Moral Imperative

By Hank Greenberg

Hank Greenberg

No state in the nation is more diverse than New York. From our inception, we have welcomed immigrants from across the world. Hundreds of languages are spoken here, and over 30 percent of New York residents speak a second language.

Our clients reflect the gorgeous mosaic of diversity that is New York. They are women and men, straight and gay, of every race, color, ethnicity, national origin, and religion. Yet, the law is one of the least diverse professions in the nation.

Indeed, a diversity imbalance plagues law firms, the judiciary, and other spheres where lawyers work. As members of NYSBA's Environmental and Energy Law Section, you have surely seen this disparity over the course of your law practices.

Consider these facts:

- According to a recent survey, only 5 percent of active attorneys self-identified as black or African American and 5 percent identified as Hispanic or Latino, notwithstanding that 13.3 percent of the total U.S. population is black or African American and 17.8 percent Hispanic or Latino.
- Minority attorneys made up just 16 percent of law firms in 2017, with only 9 percent of the partners being people of color.
- Men comprise 47 percent of all law firm associates, yet only 20 percent of partners in law firms are women.
- Women make up only 25 percent of firm governance roles, 22 percent of firm-wide managing partners, 20 percent of office-level managing partners, and 22 percent of practice group leaders.
- Less than one-third of state judges in the country are women and only about 20 percent are people of color.

This state of affairs is unacceptable. It is a moral imperative that our profession better reflects the diversity of our clients and communities, and we can no longer accept empty rhetoric or half-measures to realize that goal. As Stanford Law Professor Deborah Rhode has aptly observed, "Leaders must not simply acknowledge the importance of diversity, but also hold individuals accountable for the results." It's the right thing to do, it's the smart thing to do, and clients are increasingly demanding it.

NYSBA Leads On Diversity

On diversity, the New York State Bar Association is now leading by example.

This year, through the presidential appointment process, all 59 NYSBA standing committees will have a chair, co-chair or vice-chair who is a woman, person of color, or otherwise represents diversity. To illustrate the magnitude of this initiative, we have celebrated it on the cover of the June-July *Journal*. [www.nysba.org/diversitychairs]

Among the faces on the cover are the new co-chairs of our Leadership Development Committee: Albany City Court Judge Helena Heath and Richmond County Public Administrator Edwina Frances Martin. They are highly accomplished lawyers and distinguished NYSBA leaders, who also happen to be women of color.

Another face on the cover is Hyun Suk Choi, who co-chaired NYSBA's International Section regional meeting in Seoul, Korea last year, the first time that annual event was held in Asia. He will now serve as co-chair of our Membership Committee, signaling NYSBA's commitment to reaching out to diverse communities around the world.

This coming year as well we will develop and implement an association-wide diversity and inclusion plan.

In short, NYSBA is walking the walk on diversity. For us, it is no mere aspiration, but rather, a living working reality. Let our example be one that the entire legal profession takes pride in and seeks to emulate.

Hank Greenberg can be reached at hmgreenberg@nysba.org.

NEW YORK STATE BAR ASSOCIATION
ENVIRONMENTAL & ENERGY LAW SECTION

2020 Professor William R. Ginsberg Memorial Essay Contest

The Professor William R. Ginsberg Memorial Essay Contest is an annual competition designed to challenge law students to analyze the environmental issues confronting us today.

Topic:
Any topic in environmental law.

Eligibility:
Contest open to all JD and LLM candidate students enrolled in a New York State law school. Essays may have been submitted for course credit or for law reviews, but not as part of paid employment.

Length:
Maximum length, 35 double-spaced pages (including footnotes, which may be single-spaced).

Format:
Each entrant MUST submit a hard copy AND an electronic version in Microsoft Word.

Judging:
Criteria for judging entries will be: organization, practicality, originality, quality of research, clarity of style. Entries will be judged by environmental law professors and other distinguished members of the Environmental and Energy Law Section from throughout the State.

Awards:
The first place winner will receive a $1,000 prize, the second place winner will receive a $500 prize, and third place will receive $250. All winners will receive certificates. In addition, the 1st place essay will be published by the New York State Bar Association, and the 2nd and 3rd place essays will be considered for publication. All three winners will receive an invitation to the Fall 2020 conference of the Environmental and Energy Law Section.

To Enter:
Send hard copy to New York State Bar Association, One Elk Street, Albany, New York 12207, and email your entry to kplog@nysba.org. Include with your entry a cover letter stating your name, mailing addresses (both school and permanent), telephone number, email address, name of school, and year of graduation. This letter should also certify that the essay was not written as part of paid work. Please make sure your name and student information do not appear on the essay. No more than one entry per student per year is allowed.

Deadline:
June 1, 2020 (Winners will be announced in early September 2020.)

For Further Information:
Contact your environmental law professor or
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Outside the EPA Update

By James L. Simpson

This issue's Outside the EPA Update covers EPA activities from approximately September 1, 2018 through March 31, 2019. The column doesn't cover every single action taken (or not taken) by EPA during this time, but attempts to summarize the highlights. Notably, the federal government was shut down during this period; specifically, the shutdown began December 22, 2018 and lasted until January 25, 2019 (35 days). The shutdown impacted many, if not all, agency actions and timelines. The shutdown had obvious impacts on EPA and EPA employees who were furloughed. However, shutdowns also impacted EPA in other less obvious ways. Large federal agencies, like EPA, don't simply stop on a dime; rather, the agency must prepare for the wheels of bureaucracy to stop spinning. The agency must decide what areas and employees are essential, and employees focus on wrapping up any urgent matters as best they can before the shutdown begins. This requires substantial staff time and resources. Once the shutdown ends there is a long process of getting back up to speed. In short, federal shutdowns are highly disruptive to EPA and impact the agency's agenda and day-to-day work substantially.

Outside the EPA Update is designed to be read cafeteria style: take what you want and leave the rest. First, the column discusses some general EPA goings-on. Second, the column discusses climate change and the Trump administration's continuing efforts to reverse work done during the Obama administration. Third, the column addresses air issues. Fourth is a discussion of Superfund, including changes to the NPL. Fifth, the column discusses the thorny issue of "waters of the United States." Last, but certainly not least, the column discusses enforcement.

General EPA Goings-On

Wheeler Confirmed as EPA Administrator

On February 28, 2019, the Senate confirmed Andrew R. Wheeler as EPA administrator, after he served as acting administrator following the sudden resignation of former administrator Pruitt.[1] The Senate approved Wheeler, a former coal lobbyist, along a mostly party line vote of 52-47.

EPA Champions Deregulation Efforts

Typically, EPA administrations tend to champion human health protections and environmental protection efforts, and at least whitewash (or greenwash) other changes. The Trump administration takes a different path and chooses to champion its deregulation and rollback of environmental protections. EPA now has a webpage entitled "EPA Deregulatory Actions" that lists completed and planned deregulatory actions.[2] EPA cites President Trump's infamous 2-for-1 Executive Order, "Reducing Regulation and Controlling Regulatory Costs," which directed federal agencies to repeal at least two existing regulations for each new regulation issued as authority for its actions.[3] EPA identifies 33 completed deregulatory actions, and 41 actions still under development.

National Enforcement Initiatives Are Now Compliance Initiatives

In perhaps the most emblematic move of the Trump EPA, the Agency has changed the name of its National Enforcement Initiatives to National Compliance Initiatives. On August 21, 2018, EPA Assistant Administrator Susan Bodine announced that EPA's well-known National Enforcement Initiatives will now be known as National *Compliance* Initiatives.[4] For a few decades, EPA has used Enforcement Initiatives to focus limited resources on some of the most serious environmental issues, such as cutting hazardous air pollutants and keeping raw sewage out of waters. Typically, EPA has seven initiatives that last for a few years. For fiscal years 2020-2023, EPA has proposed continuing some initiatives, modifying some, removing some, and adding two compliance initiatives focusing on compliance with drinking water standards and reducing children's lead exposure.[5]

Climate Change

EPA Air Chief Unsure if Climate Change Is a Crisis

On Friday, January 25, 2019, Bill Wehrum, Assistant EPA Administrator for Air and Radiation, told environmental journalists that "I'm trying to figure that out" in response to a question about whether he thought climate change was a crisis.[6] Wehrum sidestepped questions about how much more time the Trump administration needed to reach a judgment on climate science and EPA's response to the issue. Journalists asked Wehrum these questions in the context of the sobering November 2018 Fourth National Climate Assessment, a report from 13 federal agencies.[7]

Affordable Clean Energy Rule

EPA had targeted March 2019 for promulgation of a final ACE rule. The government shutdown has extended this timeline to perhaps early fall. The final rule will

James ("Jay") Simpson is an Assistant Counsel with the New York State Department of Environmental Conservation, and previously was an Assistant Regional Counsel at U.S. EPA Region 2. Any opinions expressed herein are the author's own, and do not necessarily reflect the views of the NYSDEC or EPA. This column is based upon select EPA press releases and other public information covering approximately September 1, 2018 through March 31, 2019.

almost certainly face numerous legal challenges. As a result, and absent any congressional or executive action, it will be years before regulations regarding greenhouse gas emissions from power plants are in force and effect.

Proposed Repeal of Clean Power Plan

As of this writing, and also due in part to the government shutdown, EPA's proposed repeal of the Obama Administration's Clean Power Plan is still pending. The Clean Power Plan was the most ambitious of the nation's international climate reductions, and had proposed to reduce emissions from the power sector 32% from 2005 levels by 2030.

Oil and Gas Industry—New Source Performance Standards for Methane

EPA has announced plans to relax regulation of methane and other emissions from the oil and gas industry.[8] Methane is a known greenhouse gas, and significantly more powerful than carbon dioxide in terms of climate change. As part of President Obama's Climate Action Plan, EPA had issued new source performance standards (NSPS) targeting methane from new or modified fracked oil and gas wells and related equipment, and requested that states amend their SIPs to address volatile organic compounds (VOCs) from existing sources, which would also reduce methane emissions.[9] EPA's newly proposed NSPS revisions would reduce the frequency of required leak monitoring, extend the amount of time operators have to repair detected leaks, and carve out exemptions to certain detection and repair requirements. The agency accepted public comments through December 17, 2018, but as of this writing has not issued a final rule.

Kigali Amendment Enters into Force—Without the U.S.

The Kigali Amendment to the Montreal Protocol went into full force and effect on January 1, 2019, after 65 countries ratified it. Despite calls from Republican senators,[10] the Trump administration has not pushed this issue forward. The Montreal Protocol is a treaty, and any amendment to it requires Senate ratification. The Kigali Amendment seeks to phase out hydrofluorocarbons (HFCs), which are extremely potent greenhouse gases. In a textbook example of unintended consequences, the highly successful Montreal Protocol allowed HFCs as substitutes for chlorofluorocarbons (CFCs). CFCs are ozone-depleting substances and contributed to the hole in the ozone layer; their replacement has largely remedied this problem.

Air Issues

MATS Rule Reconsideration

EPA issued a proposed revised Supplemental Cost Finding for the mercury and air toxics rule (MATS). EPA released this the day before its funding lapsed from the Trump shutdown, and published notice of it after the shutdown, on February 7, 2019.[11] As expected, EPA is now proposing that it is not "appropriate and necessary" to regulate HAP emissions from coal and oil-fired power plants, and that it should not consider co-benefits in its analysis. This proposal would limit consideration of the substantial health benefits in the cost-benefit analysis for the MATS regulation.

The proposal has received a lot of opposition, even from Republicans and industry. On March 18, 2019, a bipartisan group of six senators sent a letter to EPA Administrator Wheeler urging him to withdraw this proposal and expressed opposition to changing the MATs rule.[12] On March 26, 2019, industry trade groups and labor unions sent a letter to EPA Assistant Administrator Bill Wehrum urging EPA to maintain the 2012 MATs regulations and noting the $18 billion industry has incurred already to comply with the rule, and asked EPA to "consider [these] costs" if it takes any action on the proposed rule (citing *Michigan v. EPA*, 135 S.Ct. 2699 (2015)).[13] EPA has background memos and fact sheets on the proposed revisions available on its website.[14]

Proposed "Once In, Always In" Rule under Review

On February 25, 2019, to finalize changes to EPA's longstanding "once in, always in" policy for regulating hazardous air pollutants, EPA sent a proposed rule to the White House Office of Management and Budget for review prior to publication in the federal register.[15] This follows through on EPA Air Chief Bill Wehrum's January 25, 2018 memo in which EPA withdrew the "once-in-always-in" policy. This policy held that any facility subject to major source hazardous air pollutant (HAP) standards (i.e., MACT standards) must always remain subject to those standards, even if production processes changed or the facility implemented controls to reduce its potential to emit HAPs below the 10 and 25 major source thresholds. Under EPA's new guidance, sources previously classified as "major sources" may now be reclassified as "area" sources when the facility limits its potential to emit below major source thresholds.[16] A facility is a major source if it emits 10 tons per year of any single HAP or 25 tons per year of any combination of HAPs, everything else is an area source.

California and other states have sued to stop this change in policy, and oral arguments were scheduled for April 2019. While potentially being less expensive for major sources to install certain maximum achievable control technology, the change could also result in a big increase in HAP emissions from current levels. The Trump Administration formally proposed the new rule on June 25, 2019.

EPA Approves Bush-era NSR Aggregation Rule

On November 7, 2018, EPA announced it was restoring a delayed 2009 action regarding "project aggregation" for New Source Review (NSR) permitting. "Project aggregation" refers to whether multiple related physical or operational changes to a facility should be considered

a single "project" for NSR applicability. The 2009 action explained that EPA's interpretation was that physical and/or operational changes should be combined into a single project for consideration of major NSR applicability when those changes are "substantially related."[17] EPA explains that a source need not be aggregated based on timing of the changes alone; aggregation is not required simply because changes support the plant's overall basic purpose; and EPA would presume that changes separated by three years are not substantially related.

EPA noted that it recognizes that aggregation relates closely to what it now calls "Project Emissions Accounting," formerly called "project netting" and that it expects to take comment on the interaction of these two issues when EPA undertakes rulemaking on project emissions accounting.[18]

Tonawanda Coke Facility Shutdown

On October 14, 2018, the Tonawanda Coke Corporation facility in Tonawanda, N.Y. suspended operations and started to close its facility permanently.[19] This followed a 2013 criminal conviction for violating the Clean Air Act, and a 2015 civil consent decree. New York State Department of Environmental Conservation oversaw the shutdown process, but EPA took the lead on assessing the facility. The shutdown process included shutting down coke ovens and purging them of gases.

On October 15, 2018, EPA began real-time air monitoring in and around the facility for sulfur dioxide, fine particles, and volatile organic compounds, including benzene.[20] EPA also conducted sampling at air surveillance stations in five locations in the nearby community, including an elementary school. Air monitoring and sampling continued until after shutdown was complete and all flammable gases were purged from the system. EPA reported its preliminary data revealed no exceedances of levels protective of the public. EPA will continue to post updates at EPA's Tonawanda website.[21]

Superfun! [sic] Update

EPA's Annual Superfund Report

On March 4, 2019, EPA released its Superfund annual report, covering fiscal year 2018.[22] In it, EPA announced that last year it deleted all or part of 22 sites from the National Priorities List (NPL). This is the largest number of one-year deletions since 2005.[23] EPA also announced that EPA Region 2, with 75 total deletions, leads the nation in Superfund deletions since the program began. For New York sites, the report highlights deletion of the Fulton Terminal Site, completion of a dredging and capping pilot at the Gowanus Canal Site, and EPA's assessment of environmental conditions at the former Tonawanda Coke Corporation facility in Tonawanda, New York.[24]

EPA to Preserve Gowanus Station's Historic Features

On February 22, 2019, EPA Region 2 announced an agreement to preserve historic features of the building at 234 Butler Street as part of the Gowanus Canal cleanup. This building is a local landmark important to the Gowanus community.[25] The early 20th century brick building at 234 Butler Street, known for its "Gowanus Station" terra cotta pediment on Nevins Street, was used for stables, storage, and offices by the City's then Department of Water Supply.[26] This agreement is a good example of community engagement at the site; EPA reports that unlike many Superfund sites nationwide, the community welcomed the Superfund designation and cleanup at the Gowanus.

The plan calls for the New York City Department of Environmental Protection (DEP) to construct a combined sewer overflow (CSO) storage tank, required as part of EPA's Superfund cleanup of the Canal, at the head of the Gowanus Canal next to a DEP pump station at the head of the canal. Under the plan, DEP will carefully dismantle the Nevins Street façade and approximately 25-30 feet of the Butler Street façade. To the extent practicable, DEP will preserve materials of the building that can be salvaged, including the terra cotta sign panel, window pediments, stone sills, stone water table and bricks for reuse in reconstruction of the two facades. The reconstructed facades will be incorporated into the future CSO facility headhouse building.

According to EPA, the recent completion of a dredging and capping pilot in the 4th Street turning basin marks the first time since the 1800s that a portion of the canal bottom is clean.[27]

Dredging Scheduled for Grasse River Superfund Site in Massena, New York

On March 25, 2019, EPA announced that dredging would begin in April 2019, to clean up sediment contaminated with polychlorinated biphenyls (PCBs) at the Grasse River Superfund Site (aka Alcoa Aggregation) in Massena, New York.[28] PCB contamination is the result of past waste disposal practices at the former Alcoa West (now Arconic) facility.[29] In 2013, EPA selected a cleanup plan for the site that called for dredging and capping of PCB-contaminated sediment in a 7.2-mile stretch of river. Since that time, Arconic has been working out details of the dredging and capping work. Arconic is performing the work, estimated at $243 million, under an EPA order.[30]

The dredging portion of the cleanup is expected to be completed by late fall 2019. Beginning in 2020, clean material will be placed in the river's main channel to encapsulate PCB contamination in the river bottom. The dredging, capping, and habitat reconstruction work is expected to take approximately four years to complete.[31]

EPA Proposes Magna Metals Site in Cortlandt, N.Y. for NPL

On September 11, 2018, EPA proposed adding the Magna Metals site in Cortlandt, New York to the NPL.[32] Magna Metals conducted metal plating, polishing, and lacquering operations at the site from 1955 to 1979. During operations, iron, lead, copper, nickel, zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. As a result, the soil, groundwater, a nearby stream, and sediment are contaminated with metals and volatile organic compounds.[33]

The former Magna Metals plant was demolished in 2013. Buildings on the property are currently being used for offices, a laboratory, and warehousing. Some of the properties in the surrounding area, which is primarily residential, have contaminated soil immediately adjacent to the stream, and are located near contaminated sediment.[34] Furnace Brook is the main surface water body that contains contaminated sediment, including approximately 1.5 miles of freshwater wetlands.

The state of New York investigated the contamination, collected samples and conducted studies, which resulted in immediate steps to mitigate risks from potential exposure.[35] Those steps included demolishing the former plant and installing a system to vent gas away from the occupied office and warehouse building at the facility. The New York State Department of Environmental Conservation supports listing the site on the NPL for Superfund cleanup.[36]

EPA Finalizes $7 Million Plan to Clean Up Contaminated Soil at Residential Properties at the Eighteen Mile Creek Superfund Site in Lockport, N.Y.

On October 3, 2018, EPA finalized its plan to clean up lead-contaminated soil at approximately 28 residences impacted by the former Flintkote Plant property at the Eighteen Mile Creek Superfund Site, in Lockport, New York. As part of the cleanup of the Eighteen Mile Creek Site, EPA will remove and transport approximately 14,000 cubic yards of contaminated soil for off-site disposal. The excavated areas will be restored with clean soil.[37]

Eighteen Mile Creek has a long history of industrial use dating back to the 1800s. The headwaters of the Creek consist of an east and west branch beginning immediately north of the New York State Barge Canal in Lockport. Eighteen Mile Creek flows north approximately 15 miles and discharges into Lake Ontario in Olcott, New York. Investigations at the site show that sediment and soil in and around Eighteen Mile Creek and nearby properties are contaminated with a variety of pollutants, including PCBs and lead.[38]

The former Flintkote Plant property located at 198 and 300 Mill Street operated between 1928 and 1971 and manufactured felt products.

Soil Cleanup to Begin at Niagara Mohawk Power Corporation Superfund Site in Saratoga Springs, N.Y.

On November 1, 2018, EPA announced that a cleanup of contaminated soil would begin at the Niagara Mohawk Power Corporation Superfund Site in Saratoga Springs, N.Y.[39] The site, which was once used to manufacture gas from coal, is contaminated with polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs).[40] This is the second and final phase of cleanup at the site. It includes cleanup of contaminated soil in a half-acre area near Excelsior, Warren and High Rock Avenues in Saratoga Springs. The work is scheduled to continue through spring 2019.

Water

EPA and Army Corps Propose New "Waters of the United States" Definition

On December 12, 2018, EPA announced that it and the Army Corps are proposing a new definition of "waters of the United States" (WOTUS) under the Clean Water Act.[41] Due to the shutdown, EPA and the Army Corps published the proposal on February 14, 2019.[42] The proposed rule is the second part of the Trump Administration's two-step process to repeal (step one) and revise (step two) the Obama administration's Clean Water Rule. As of this writing, the 2015 rule is in effect in 22 states as litigation continues.[43]

The WOTUS definition has significant reach and effect under the Clean Water Act, including: (i) water quality standards and TMDLs under CWA § 303; (ii) oil spill programs under CWA § 311; (iii) water quality certifications under CWA § 401; (iv) NPDES permits under CWA § 402; and (v) dredge and fill permits under CWA § 404. Many more regulations implementing these programs, and others, also rely upon the WOTUS definition.

Significantly, the proposed rule would greatly limit Clean Water Act jurisdiction for wetlands with no "direct hydrological surface connection" to other WOTUS covered waters. The proposal would also exclude ephemeral streams that flow only after rain or during snowmelt, and seeks comment on whether to also exclude intermittent streams.

It's EPA's intention that states will fill the anticipated regulatory gap regarding wetlands. While New York has a regulatory permitting program for freshwater and tidal wetlands, about half the states do not.

This writer is willing to make a bold prediction that litigation may follow the proposed WOTUS rule.

Enforcement

U.S. DOJ Acknowledges Pace of Settlements Has Slowed

On October 18, 2018, then-Acting Assistant General for the U.S. Department of Justice's Environment and

Natural Resources Division Jeffrey H. Wood stated at an address to the ABA's Section of Environment, Energy, and Resources that it is "true, we've slowed the pace of [environmental] settlements."[44] Acting Assistant Attorney General Wood stated further that, with respect to "sue and settle," DOJ was following the Clean Air Act process for settlement of consent decrees, applying it to all statutes, and seeking public comment on them. Mr. Wood noted that DOJ was "expanding this across the field to all statutes."[45] The Clean Air Act is unique among major environmental statutes because it requires public notice and opportunity for comment on any consent decree or settlement under the Clean Air Act.[46] EPA's "sue and settle directive," issued by former Administrator Scott Pruitt, requires public notice of all consent decrees.[47]

Civil Penalties Drop Dramatically During Trump Administration

A recent Harvard study found that civil penalties under the Trump administration dropped dramatically when compared to penalties since 1994.[48] Cynthia Giles, who formerly headed EPA's Office of Enforcement and Compliance Assurance, conducted the study by an analysis of publicly available data from ECHO—EPA's Enforcement and Compliance History online database. Even when not including the recent massive fines against BP for the Deepwater Horizon spill and Volkswagen for cheating on emissions tests (both during the Obama Administration), the Trump EPA's 2018 total penalties represented a 55 percent drop from the annual average.[49]

EPA's Criminal Enforcement Number Dropping

On January 15, 2019, a watchdog group, the Public Employees for Environmental Responsibility, reported it had analyzed Department of Justice data and found that EPA's criminal enforcement division has hit a 30-year low under the current administration.[50] EPA referred only 166 cases for criminal prosecution in the last fiscal year. EPA criminal enforcement actions against polluters rose in 1998, when the agency made 592 criminal referrals under President Clinton. Since that time, criminal referrals have been on a steady downward trend, particularly under the Trump administration. They slowed even further after Andrew Wheeler took over from former EPA Administrator Scott Pruitt, with only 24 criminal referrals made in the first two months of fiscal 2019.

EPA Sues NYC for Failure to Cap Hillview Reservoir

On March 18, 2019, EPA and the Southern District of New York announced that EPA had sued New York City under the Safe Drinking Water Act for its "longstanding failure" to cover the Hillview Reservoir.[51] EPA and NYC entered a consent decree which will require the City to make improvements and cover the Reservoir at a total estimated cost of $2.975 billion, and to pay a $1 million civil penalty.[52] The State of New York is a co-plaintiff and a party to the consent decree. Eager readers wanting to see the reservoir covered should not hold their breath; full completion is not expected until 2049.

Hillview is part of New York City's legendary public water supply system, delivering up to a billion gallons of water per day. The Reservoir, located in Yonkers, is the last stop for drinking water before it enters the City's water tunnels for distribution to City residents. The 90-acre reservoir is divided into two segments, the East and West Basins. Prior to the water entering the Reservoir, it receives ultraviolet treatment and is treated with chlorine to remove pathogens. Because Hillview is an open storage facility, the treated water in the Reservoir is subject to recontamination with microbial pathogens from birds, animals, and other sources.

The City has been required to cover the Reservoir since it first executed an administrative order with the State of New York on March 1, 1996. Under the Safe Drinking Water Act, the City also became obligated, as of March 6, 2006, to cover the Reservoir by April 1, 2009.[53] In May 2010, EPA entered an administrative order with the City requiring the City to meet a series of milestones to cover the Reservoir.[54] The first milestone was Jan. 31, 2017. When the City failed to meet that date, EPA sued.[55]

The consent decree requires construction of two projects in addition to the cover, the Kensico Eastview Connection and the Hillview Reservoir Improvements. The Kenisco Eastview Connection entails construction of a new underground aqueduct segment between the upstream Kensico Reservoir and Eastview ultraviolet treatment facility. The Hillview improvements detail extensive repairs to the Hillview Reservoir, including replacing the sluice gates that control water flow and building a new connection between the reservoir and water distribution tunnels. Completion of these two projects is anticipated by 2035 and will occur prior to covering the reservoir.

EPA Settlement with Yonkers Dry Cleaner Means Company to Operate as "Green" Facility

On November 8, 2018, EPA announced a settlement with the Frey Cleaners, Inc. dry cleaning facility in Yonkers, N.Y. for past violations.[56] The company will invest at least $60,000 in a supplemental environmental project (SEP) to become a "green" dry cleaning facility by replacing its old dry-cleaning machines with a new alternative solvent dry-cleaning machine and use environmentally friendly solvents.[57] This dry cleaner had been using "Perc" (perchloroethylene) which can have serious health impacts, including liver damage and increased risk of cancer. The company will also pay a $7,975 penalty.

EPA Announces Compliance Agreements with Six New York Companies for Lead Paint Violations

On October 31, 2018, EPA announced six enforcement actions it took in the past year against companies for violations of laws that protect the public from exposure to lead from lead-based paint.[58]

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DEC DISPATCH

By Thomas J. King

DEC Dispatch is a new column designed to provide practitioners with an update on recent legislative, regulatory, and case law developments that impact the practice of environmental law in New York. This edition covers recent amendments to the regulations implementing the State Environmental Quality Review Act (SEQR), with a focus on specific amendments related to historic and cultural resources, and provides summaries of some recent SEQR case law.

SEQR Amendments and Historic Preservation

On June 27, 2018, the New York State Department of Environmental Conservation (DEC) adopted amendments to the SEQR regulations found at 6 N.Y.C.R.R. Part 617. These amendments became effective on January 1, 2019. SEQR practitioners should be aware of these amendments and use the new Environmental Assessment Forms (EAFs) available on DEC's website: https://www.dec.ny.gov/permits/6191.html. In addition to revising the EAFs, DEC has released a draft of the fourth edition of its SEQR Handbook, which, along with the express terms of the amendments, can be found at https://www.dec.ny.gov/permits/83389.html.

Among the changes, DEC has adopted amendments to the Type I and Type II lists of actions, as well as the scoping and acceptance procedures for draft environmental impact statements. DEC has also updated the regulations related to web publication of documents. These changes are the first major amendments to the SEQR regulations that DEC has made since 1996. In this edition of *DEC Dispatch*, we focus specifically on how the SEQR amendments intersect with historic and cultural resources.

For years SEQR practitioners reviewing small, otherwise Unlisted projects sometimes scratched their heads at the requirements of 6 N.Y.C.R.R. § 617.4 (b) (9) that required their projects be categorized as Type I actions because they were proximate to a historic or cultural resource. Unlike other place-based Type I categories (e.g., parkland and agricultural districts), 6 N.Y.C.R.R. § 617.4 (b) (9) did not have a threshold that distinguished between smaller and larger projects. For example, some projects located in historic districts or substantially contiguous to properties listed on the State Register of Historic Places were classified as Type I actions regardless of their size. Classifying a project as a Type I action as opposed to an Unlisted action requires use of a Full EAF, coordinated review, and publication in the Environmental Notice Bulletin (ENB).

The recent SEQR amendments modify the language of 6 N.Y.C.R.R. § 617.4 (b) (9) to align it with the two other place-based Type I actions; specifically, 6 N.Y.C.R.R. § 617.4 (b) (8) related to actions occurring within established agricultural districts, and 6 N.Y.C.R.R. § 617.4 (b) (10) related to actions occurring within any parkland, recreation area, or designated open space. Under the changes, such otherwise-Unlisted actions are only elevated to Type I actions if they exceed 25% of any threshold on the Type I list, found at 6 N.Y.C.R.R. § 617.4 (b). The Type I list contains a series of thresholds intended to differentiate Type I versus Unlisted actions. The most common threshold is for ten or more acres of physical alteration. Thus, for example, if a construction project was proposed next to a property listed on the National Register of Historic Places but involved less than 2.5 acres of physical alteration then it would most likely not be classified as a Type I action (unless the project met one of the other thresholds in the Type I list). While this specific amendment is aimed at streamlining the SEQR process, another amendment to 6 N.Y.C.R.R. § 617.4 (b) (9), discussed below, is aimed at strengthening protection of historic and cultural resources.

Thomas J. King

Prior to the recent SEQR amendments, 6 N.Y.C.R.R. § 617.4 (b) (9) was generally only implicated in situations in which a historic or culturally significant property was *listed* on either the State or Federal Register of Historic Places. The recent SEQR amendments add to this Type I category those resources that have been determined by the Commissioner of the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) to be *eligible* for listing on the State Register of Historic Places pursuant to Parks, Recreation and Historic Preservation Law §§ 14.07 and 14.09. Information regarding eligible resources can be found through reviewing the Cultural Resource Information System, located at https://cris.parks.ny.gov, or by contacting OPRHP's Division for Historic Preservation. DEC clarified in its Final Generic Environmental Impact Statement that classifications made under 6 N.Y.C.R.R. § 617.4 (b) (9) are to be made based on those resources listed or determined eligible prior to an agency's issuance of either a negative or positive declaration. For example, a resource determined to be eligible for listing on the State Register of Historic Places after an agency has issued a negative or positive declaration is of no consequence to the classification of the action.

Thomas J. King is a Senior Attorney with the New York State Department of Environmental Conservation. Any views expressed by the author do not necessarily represent the views of the New York State Department of Environmental Conservation.

The recent SEQR amendments also include a new Type II action for installation of solar energy arrays or panels on existing structures. Recognizing that such solar energy arrays may in some instances be incongruous with certain historic resources, DEC excluded from this new Type II action solar energy arrays or panels proposed to be located on the following structures: (i) structures listed on the National or State Register of Historic Places; (ii) structures located within a district listed in the National or State Register of Historic Places; (iii) structures that have been determined by the Commissioner of OPRHP to be eligible for listing on the State Register of Historic Places; or (iv) structures within a district that has been determined by the Commissioner of OPRHP to be eligible for listing on the State Register of Historic Places. DEC's exclusion thus requires installations of solar arrays on such historic properties to be reviewed under SEQR on a case-by-case basis.

Recent SEQR Cases and Holdings

***Stengel v. Town of Poughkeepsie Planning Bd.*, 167 A.D.3d 752 (2nd Dep't 2018)**

A Town Planning Board's issuance of a negative declaration constituted its "final action" triggering the commencement of the four-month statute of limitations under CPLR Article 78.

***Shieve v. Holley Volunteer Fire Co.*, 2019 N.Y. Slip Op. 01982 (4th Dep't 2019)**

Petitioner did not establish environmental injury-in-fact to confer standing for CPLR Article 78 challenge to local volunteer fire department's "Squirrel Slam" hunting contest fundraiser.

***City of Rye v. Westchester County Bd. of Legislators*, 169 A.D.3d 905 (2nd Dep't 2019)**

Municipal petitioner did not have standing by way of its status as an "involved agency" under SEQR to challenge the negative declaration of the Westchester County Board of Legislators. In addition, the individual petitioners did not have standing to proceed as they failed to demonstrate either an entitlement to a presumption of standing or injury-in-fact within the zone of interests protected by SEQR.

***Sierra Club v. New York State Dept. of Envtl. Conservation*, 169 A.D.3d 1485 (4th Dep't 2019)**

Petitioner's CPLR Article 78 challenge to respondent's SEQR review was rendered moot when construction activity covered by the review was substantially completed.

***Berg v. Planning Bd. of the City of Glen Cove*, 93 N.Y.S.3d 407 (2nd Dep't 2019)**

The Respondent's determination of whether a Supplemental Environmental Impact Statement (SEIS) was necessary under SEQR was based upon a "hard look" at the relevant areas of environmental concern, supported by a reasoned elaboration, and was therefore upheld.

For your **dedication**,
For your **commitment**, and
For recognizing the **value** and
relevance of your membership.

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Henry M. Greenberg
President

Pamela McDevitt
Executive Director

NYSBA NEW YORK STATE BAR ASSOCIATION

Long-Time Member: James Rigano

For this issue we have focused our Long-Time Member profile on James ("Jim") Rigano, the New York State Bar Association Environmental and Energy Law Section's newest officer. Jim is the founder of Rigano LLC, where he concentrates his practice exclusively in environmental law. Jim and Rigano LLC, which has four attorneys including Jim's two sons, handle a wide range of environmental matters with a focus on subsurface contamination issues and a range of brownfield redevelopment matters. The firm also handles substantial environmental litigation on a wide variety of issues including wetland and endangered species issues. Prior to forming Rigano LLC, Jim was a partner at a number of Long Island law firms, and prior to entering private practice he served in the Enforcement Division of the United States Environmental Protection Agency, where he was involved in a variety of water pollution control programs. Jim also served as environmental counsel to the New York Power Authority.

As its newest officer, Jim is the EELS Secretary. He will proceed on to Treasurer, Vice-Chair, and finally to Chair over the next few years. Jim has chaired the Continuing Legal Education Committee of the Section for many years. In that capacity, Jim has organized many environmental law conferences. He also has spoken at conferences and published regularly.

Jim is particularly concerned about the impact of groundwater contamination on Long Island's sole source aquifer. He was the General Counsel for the Central Pine Barrens Commission on Long Island for 10 years and represented the three towns and a county regarding the protection of the 100,000-acre Pine Barren forest Preserve in Suffolk County. In recent years, Jim has been representing municipalities, individuals, and environmental groups in litigation against major corporations that have caused significant groundwater contamination on Long Island. Jim is currently handling a number of matters involving emerging contaminants. These cases involve cost recovery to remediate groundwater contamination and seek to have government and responsible parties address the cleanup of Long Island's sole source aquifer and water supply.

On a personal level, Jim is acutely interested in responses to climate change, including the development of electric cars powered by solar energy, and has commenced a new initiative with regard to this concept. He is active in his church and deeply appreciative of the spiritual enrichment that it provides.

EELS is fortunate to have had Jim as a dedicated member for so many years.

Aaron Gershonowitz

ANNUAL MEETING 2020 EELS EVENTS

Thursday, January 17

3:00 p.m. - 4:00 p.m.
Committee Meetings

4:00 p.m. - 5:00 p.m.
Environmental Agency Update

5:00 p.m. - 5:30 p.m.
Annual Business Meeting and Awards

5:30 p.m. - 7:00 p.m.
Cocktail Reception

Contact Kathy Plog at kplog@nysba.org to register for Thursday events

Friday, January 18

8:30 a.m. - 12:30 p.m.

Environmental & Energy Law Section Meeting

Evolving Environmental & Energy Issues – 2019 & Beyond

4.0 Credits

1.0 Ethics | 2.0 Areas of Professional Practice | 1.0 Diversity, Inclusion and Elimination of Bias.
This program is transitional and is suitable for all attorneys including those newly admitted.

Visit www.nysba.org/AM2019eels to register for Annual Meeting 2020

New Member Profile: Matthew Sinkman

For this issue of *The New York Environmental Lawyer*, our New Member Profile features Matthew J. Sinkman. Matt is currently an Assistant Attorney General in the Environmental Protection Bureau of the New York State Office of the Attorney General. Matt has been interested in the environment since childhood and that interest was a strong motivation for him to attend law school.

Matt's legal and academic career have provided him a broad range of expertise—from commercial litigation at a large corporate law firm to clerking for the Honorable Richard Owen in the Southern District of New York. With Matt's extensive background across a general slate of issue areas, he decided to finally take the leap into environmental law after years in private practice at mid-sized firms. His time in private practice instilled in him a unique perspective that has helped him flourish in the environmental field.

Matt studied History at the University of Michigan and received his Juris Doctor from Boston University School of Law in 2007. In addition to his membership with the NYSBA Environmental and Energy Law Section, Matt is on the International Human Rights Committee of the New York City Bar Association. Notably, Matt was selected for inclusion in the Super Lawyers®—Metro New York Edition as a "Rising Star"(Business Litigation), 2014-2016.

Although his path before the Attorney General's office was predominantly corporate law, Matt always retained a connection to environmental law, specifically through his membership in the NYSBA Environmental and Energy Law Section. Matt joined NYSBA EELS in 2013 for educational purposes and to become a part of the New York environmental law community. This connection to the environmental world not only acted as a bridge for Matt, but also gave him a competitive edge for attaining his position in the Attorney General's office when he was ready to dedicate his career to public service.

Matt was inspired to pursue environmental law because of his desire to make a positive impact on the world. On a day-to-day basis, his caseload is principally related to Superfund projects. This allows Matt to address fundamental public health issues. Because environmental issues are directly correlated with socioeconomic and racial inequities, Matt is also able to positively impact low-income communities by remedying the environmental catastrophes that plague them. Matt is also involved in various litigation related to the emerging contaminants PFOA and PFOS that have afflicted several environmental justice communities in New York. His pursuit of public service and corporately honed skills led him to NYSBA EELS and we appreciate the distinct perspective Matt brings to the Section.

Alicia Artessa

In Memoriam

Joseph J. Zedrosser, Esq.

Joseph J. Zedrosser, a long-standing member of the Environmental and Energy Law Section, died at his home in Manhattan on February 20, 2019. Joe was an outstanding and gifted environmental lawyer for several decades. Born in Milwaukee of working-class parents who had emigrated from rural Austria, Joe came to New York after graduating from Marquette University and Harvard Law School. Like many who arrived in New York as an adult, he never left Manhattan after that. After serving as a criminal defense attorney in the federal court for the Southern District of New York, Joe joined the New York State Attorney General's Environmental Protection Bureau in 1975. He worked on important cases including legal challenges to offshore oil drilling in Long Island waters, prosecuting tidal wetland offenders and safeguards for shipping nuclear materials. He then became regional counsel at the USEPA for Region Two (New York, New Jersey, Puerto Rico and the Virgin Islands), taught environmental courses at St. John's University School of Law, and practiced environmental litigation and counseling at the Rivkin Radler and Breed Abbott law firms. He gave numerous lectures on a variety of environmental law subjects for the Section and other venues. He was a devotee of classical music and jazz, especially Brazilian jazz. He traveled to India, Africa, and other places of great historic and cultural interest. He was a good friend to many of us in the Section and will be greatly missed.

Professor Philip Weinberg

Environmental and Energy Law Section Awards: 2019

By Louis A. Alexander

Each year the Environmental and Energy Law Section recognizes individuals and organizations whose work and commitment have made a significant contribution to the environment. The Section, at its annual meeting in New York City on January 18, 2019, presented this year's **Environmental and Energy Law Section Award** to **Peggy M. Shepard**, the Co-Founder and Executive Director of WE ACT for Environmental Justice, in recognition of her environmental leadership and advocacy and commitment to environmental justice.

(L to R): Former Section Chair Marla E. Wieder and Awards Committee Chair Louis A. Alexander presenting the 2019 Environmental and Energy Law Section Award to Peggy M. Shepard, co-founder and executive director of WE ACT.

Peggy M. Shepard's environmental leadership has been instrumental in advancing environmental protections, both locally in New York City and on the state and national levels. She is a pioneering and highly respected advocate on matters relating to environmental justice. Her work on environmental justice embodies the principle that the right to a healthy and sustainable environment extends to all communities.

Ms. Shepard's advocacy and activism, in particular, have ensured that the environmental needs of urban residents receive governmental attention. As a result of her organizational abilities at the grassroots level and her skills as a coalition-builder, Ms. Shepard has helped to achieve more responsive and accountable governmental action. She has also helped to ensure that all people, no matter what their socio-economic status, receive the benefits of environmental programs and initiatives as well as have the opportunity to meaningfully participate in environmental decision making.

Prior to the presentation of the Award, former Section Chair Michael B. Gerrard offered personal remarks on Ms. Shepard and her career. Mr. Gerrard noted Ms. Shepard's early years as a journalist and her distinguished service on a number academic, health-related and other government advisory boards. He underscored Ms. Shepard's longtime commitment and dedication to the environment and the successes that she has achieved, both individually and as the Executive Director of WE ACT, the Harlem-based environmental justice organization. Mr. Gerrard referenced, in particular, Ms. Shepard's role in organizing community support that led to a major retrofit of New York City's North River sewage treatment plant, and the receipt of millions of dollars in funding for an odor abatement plan and other environmental benefits for the community.

In remarks following her receipt of the reward, Ms. Shepard addressed the current challenges that the nation now confronts with respect to environmental policy, climate change, and environmental justice. She stressed the need for continued support for legislative and regulatory action that would advance a clean, healthy, and sustainable environment for all.

Section Council Awards

In addition to the Environmental and Energy Law Section Award, Section Council Certificates were given in 2019 to two members of the Environmental and Energy Law Section: **Amy K. Kendall**, in recognition of her distinguished service to the Section as a Co-Chair of the Coastal and Wetland Resources Committee, her serving as the Section representative to the NYSBA House of Delegates, and her organizing and participating in Section programs that address environmental issues; and **Amy Lynn Reichhart**, in recognition of her distinguished service as a Co-Chair of the Hazardous Waste/Site Remediation Committee, and of her providing significant information to the Section on legal and policy issues relating to hazardous and solid waste management.

The Section's 2019 Awards Committee was comprised of the following Section members—Louis A. Alexander (chair), Alita J. Giuda, Barry Kogut, Frank Piccininni, and Miriam Villani.

Louis A. Alexander, former Chair and Awards Committee Chair, bestowing the Section Council Award on Amy K. Kendall

Jose Almanzar, Panel Chair for Environmental Justice: Enforcement & Advocacy

Annual Meeting January 2019

Peggy Shepard, Section Award Winner and Keynote Speaker

Past Chair Virginia Robbins and Chair Marla E. Wieder present certificate to Minority Fellowship winner Asha Brundage-Moore

Louis Alexander, Awards Committee Chair, with Amy Kendall and Section Chair Marla E. Wieder

Marla E. Wieder, Chair, bestowing outgoing Chair, Kevin Bernstein, with a recycled glass chair award

Officers Nick Ward-Willis, Linda Shaw and Chair Howard Tollin with Fall Meeting Program Co-Chairs Susan Amron and Michael Bogin

Keynote Speaker Peter Lehner, Managing Attorney, Earthjustice

Environmental and Energy Law Section Fall Meeting

Miriam Villani, Editor and Howard Tollin, Section Chair with First Place Professor William R. Ginsberg Memorial Essay Contest Winner, Frederick McDonald III

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Words from our 2019 Minority Fellow, Asha Brundage-Moore

This summer I worked at New York Lawyers for the Public Interest in its Environmental Justice section. I chose this organization because its Environmental Justice section focuses on representing community organizations advocating for justice in environmentally overburdened neighborhoods.

At NYLPI I had the opportunity to experience working on several different projects while developing a range of legal skills. Some highlights of my summer include: testifying at City Hall in front of the Environmental Protection Committee advocating for the creation of an Office of Sustainability subject to direct oversight by City Counsel and not predicated on the mayor's support for climate-related issues; observing NYLPI lawyers defending motions and arguing as amici with the City in state court; and working on the first Article 10 administrative action in New York City since the law was updated in 2011.

Throughout the summer I worked on both litigation and community organizing projects. My primary project was working on the Article 10 proceeding. This involved preparation for and participating in an administrative hearing where NYLPI's client acted as an intervenor in the repowering of a peaking power plant also known as a peaker plant. I submitted comments on the power company's proposed plan, went to community meetings, and researched Article 10 statutes for my supervisors as this was the first case of its kind in New York City.

For my other major project, I assisted NYLPI with its support of the Fair Play Coalition in its fight against the City's Public School Athletic League (PSAL) to provide more support to majority Black and Latinx schools, which have statistically significantly fewer interscholastic sports opportunities than schools that are minority Black and Latinx. I helped prepare staff attorneys for settlement negotiations with the PSAL. I also worked with—and continue to work with—coalition members (students and student-led non-profits like IntegrateNYC) plan a field day for schools with fewer than 10 sports teams in order to build solidarity and teach students about inequity in New York City public school sports opportunities.

I enjoyed my summer at NYLPI because of the variety of projects I was assigned. I found working with community organizations to be rewarding because of their deep understanding of their community members' needs. The best part of working for NYLPI was getting a chance to see how it uses every tool in its belt—including preparation for litigation, pushing legislation, and other tools like administrative hearings and settlements—to advance its clients' needs. I am interested in finding an organization like NYLPI in my future environmental work, wherever that takes me.

Asha Brundage-Moore is a third-year student at New York University School of Law where she is a Root-Tilden-Kern Public Interest Scholar and Editor-in-Chief of the law school's *Environmental Law Journal*. Asha was selected by the Section to receive the 2019 Minority Fellowship in the amount of $7,500. For 10 weeks this summer she worked at New York Lawyers for the Public Interest in its Civil Rights Legal Internship Program where she was placed in the Environmental Justice Program.

Asha received her B.A. in Human Biology from Stanford University where she focused on Food Policy and spent a summer interning for USDA. She also worked two summers at Full Circle Farm's summer camp investigating the effect of hands-on farming experiences on children's vegetable preferences. Asha developed an interest in food policy growing up in Oakland, CA where she witnessed first-hand the impact of food insecurity on low-income communities.

At NYU Law, Asha continued to pursue her policy interest by spending her 1L summer at the Pace Law School Food and Beverage Law Clinic where she assisted small farm businesses. In the fall of 2018, Asha was a litigation intern for the NYU Environmental Law Clinic that is hosted by the Natural Resources Defense Council.

The Dirt on Clean Coal

By Richard J. Izzo

Around 300 million years ago, during the aptly-named "Carboniferous" Era, plants on the edges of countless sedimentary basins were buried by tectonic activity (and the resulting rise in sea level), and thus, coal (the staple of energy production for over a century) was born. Of course, a lot of things had to happen over the 300 million years to turn the buried plant matter into coal. Over time, heat and pressure caused the cellulose in the plants to change to peat and then eventually to the four "grades" of coal including lignite or brown coal, sub-bituminous, bituminous, and finally, anthracite. Although all grades may be used as fuel, bituminous is by far the most common in the U.S. and produces the highest BTUs. Bituminous is also used as "coking" coal to produce steel.

Coal has been used to generate electricity in the U.S. since 1882 when it was the chief source of fuel for the Edison Plant in New York City. By the mid-20th century, coal was the leading fuel for electric power production across the country. Although its use is on the decline (around 20% in the past 20 years) in favor of cleaner cost-effective fuels such as natural gas, coal is still widely used in the U.S. According to the U.S. Energy Information Administration (EIA), as recently as 2017, coal accounted for around 30% of all fuel used for generating electricity.

Coal continues to have the distinction of being the "dirtiest" of all fossil fuels. Its production of greenhouse gases ranks first among fossil fuels. In addition, the burning of coal releases a number of airborne toxins including mercury, lead, sulfur dioxide, nitrogen oxides, particulates, and various heavy metals. In addition, many of these same toxins remain in the estimated 100-million tons of coal ash generated annually. Much of this coal ash winds up in ponds, lakes, and landfills, potentially contributing to surface water and groundwater contamination. Coal mining itself produces contaminated wastewater, and although government restrictions were previously in place to regulate mining waste disposal, many of these restrictions have been lifted over the past year by the current administration.

So now that we've spent all this time talking about regular old "dirty" coal, let's talk about "clean" coal. How is clean coal produced? Surely clean coal is much better for the environment than dirty coal, right? Proponents of coal have been tossing this term around for the past few years and have created some confusion among the general public that clean coal is a real type of coal. Unfortunately, it's not. Banish from your mind, if you will, the image of hundreds of aproned minions furiously scrubbing away at chunks of the grimy black stuff to produce a shiny pristine fuel. No. Clean coal, albeit a slick marketing ploy, is not a type of coal, but rather it is a collection of technologies/processes designed to reduce coal emissions. Some of these have been around for decades including wet scrubbers to removed sulfur dioxide, electrostatic precipitators to remove particulates, and coal washing (yes they do wash it, sort of) in which the coal is ground up and mixed with liquid to allow impurities (metals, etc.) to precipitate out.

The most recent process employed for the reduction of greenhouse gas emissions is known as Carbon Capture and Storage (CCS). This technology may be employed for all fossil fuels, not just coal, and involves the capture of carbon dioxide (CO^2) during or before combustion. During combustion, the CO^2 may be captured from the exhaust by absorbing it into a solvent which is later heated to release the gas for storage. Other methods for separating CO^2 during combustion include high pressure membrane filtration, adsorption/desorption processes and cryogenic separation. Pre-combustion removal is done through gasification which combines coal with steam and oxygen to produce "syngas"—a mixture of carbon monoxide and hydrogen. After the CO^2 is captured, it is injected into the ground in oil or gas fields for reuse in enhanced fuel recovery.

As you may have guessed by now, the biggest obstacle for use of these technologies is cost. It is estimated that the cost for a coal-burning power plant using CCS technology is roughly 75% higher than for those with no carbon capture. With natural gas prices continuing to remain attractively low, the cost/benefit of this approach on a large-scale basis appears irreconcilable. In addition, neither CCS, nor any of the other "clean" coal technologies described above solve the problem of coal ash or mining waste disposal. With this in mind, and with anthropogenic greenhouse gas production's proven impact on climate change, it would seem that the best way forward is to continue to phase out the use of coal and other carbon-emitting fossil fuels in favor of more sustainable alternative energy sources such as solar and wind. Doing so would provide a "brighter" future and clear skies for all of us.

Richard Izzo, CPG, is Vice President at CA Rich Consultants. Mr. Izzo designs, implements, and manages environmental testing and remediation programs involving soil, groundwater, and soil vapor impacts. He has successfully guided clients through numerous regulatory compliance programs and has helped clients satisfy or close out orders on consent, petroleum and chemical spill cases, and other regulatory agency-issued agreements. Mr. Izzo has been called upon as an expert witness in several matters involving the transfer of environmentally-impacted real property, and remediation of chemical and petroleum releases. In addition, he heads up CA Rich's water resource exploration, development, and management capabilities including watershed hydrologic budgets, groundwater investigations, aquifer mapping, safe yield determination, and water allocation permitting. Mr. Izzo holds credentials as a Certified Professional Geologist and as a Hazardous Waste Emergency Response Supervisor.

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Quicksilver and the Madness of the Hatters

By Walter Mugdan

One of the engaging characters created by Lewis Carroll in *Alice in Wonderland* is the Mad Hatter, and the phrase "mad as a hatter" has been around for nearly 200 years. But why? Why should 19th century hat makers have been thought of as mad? Well, because they often were; at least, they became so after years working as a hatter.[1]

And why did hatters become mad? Because they used a compound of mercury to stiffen the felt used to make hats. Mercury is severely toxic, but before it kills you it is likely to drive you mad—quite literally.[2]

Mercury is an extraordinary element—a shiny metal that is liquid above -40° C., and that slowly evaporates (i.e., turns into a gas) at around room temperature. In the past it was known by its Greek name, *hydragyrum*, meaning *liquid silver.* (That's why chemists know it as Hg, its symbol in the Periodic Table of Elements.) Its common name, quicksilver, means much the same—*quick*, in the sense of "alive" (as in the phrase "the quick and the dead"); and *silver*, because of its appearance.

Mercury occurs widely in nature, typically as cinnabar, a red ore that is, among other things, the source of the pigment vermillion. Because the metal is sensitive to changes in temperature and pressure, it has been widely used in instruments such as thermometers, barometers, blood pressure meters, and thermostats.

Mercury has been used in medicine for over a millennium—often with unintended horrible consequences. Starting as early as the 15th century it was used to treat skin diseases. By the 16th century it was used (with some success) as a treatment for syphilis, though its benefits as a curative were eclipsed by its deleterious effects; more about those later. In more recent years, mercury was put to use as a topical antiseptic for minor cuts and burns, known as *mercurochrome*. In this capacity it is quite effective; but this use has been banned in a number of countries including the United States.[3]

When liquid mercury is mixed with powdered silver and other metals it forms an exceptionally hard, durable amalgam that has been used for hundreds of years to fill dental cavities. People may refer to these as "silver fillings," but they contain more mercury than silver; more about this later, as well.

Mercury and its various compounds have been used in many industrial and commercial applications. Among the most common was its use in the manufacture of chlorine—another very useful but very dangerous element. Mercury conducts electricity well, and has been used extensively in motion sensitive switches, like the switch that turns on the light next to the little mirror on the back of automobile sun visors, or the light that comes on when the trunk is opened. (Because it's a liquid, the mercury flows up and down inside the switch depending on the position of the visor or the trunk hood, and thus either completes the electrical circuit or breaks it.) Mercury switches have largely been phased out of automobiles, but to this day fluorescent light bulbs use mercury vapor that (indirectly) causes the bulb to glow when an electrical current is passed through.[4]

"Mercury is undeniably a valuable and useful element, but there is a very dark side to this bright, shiny metal. In almost all its forms and compounds, mercury is extremely toxic, whether ingested, inhaled, or absorbed through the skin."

Mercury vapor lamps were used widely until recently.[5] They are more energy efficient than incandescent and most fluorescent lights, have a long bulb life, and produce a high intensity, clear white light. They were used extensively for streetlights and large area overhead lighting.

Mercury is undeniably a valuable and useful element, but there is a very dark side to this bright, shiny metal. In almost all its forms and compounds, mercury is extremely toxic, whether ingested, inhaled, or absorbed through the skin. Effects include damage to the kidneys, the lungs, and—as experienced by the hatters—the nervous system and the brain. Symptoms include drooling, uncontrollable muscle tremors and twitching (called "hatter's shakes"), distorted vision, slurred speech, confused thinking, and—in severe cases—hallucinations and psychotic episodes. It's no wonder hatters were called mad (when they weren't mistaken for drunks). Even low-level exposure, when continued for an extended time, has adverse effects including fatigue, irritability, loss of memory, vivid dreams, and depression.

Much of the medical quackery of the past is now thankfully behind us. But people (and wildlife) are still

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being exposed to mercury, primarily through environmental and dietary pathways.[6]

Most mercury exposure today is from atmospheric mercury emissions. About half of the mercury in the atmosphere comes from natural sources, primarily volcanoes. Nearly two thirds of the remaining emissions come from burning coal and, to a much lesser extent, oil. These atmospheric emissions reach us either directly by inhaling the air, or indirectly through our food, particularly fish.

Multiple forms of mercury are highly soluble in water. Air emissions often settle out onto water bodies, elevating mercury levels in the water and the sediments, where aquatic animals become exposed. Mercury bioaccumulates, meaning that concentrations in animals increase up the food chain. Small creatures like worms, shrimp and other crustaceans take in mercury from the water and sediment; small fish eat those animals along with their mercury load; in turn, larger fish each the smaller fish; and finally, at the top of the food chain, people and other predators (eagles, ospreys, herons, seals, otters, etc.) eat the larger fish. At each step of the way up the food chain, the concentration of mercury increases.

"Eating fish is definitely part of a healthy diet, but the risks from mercury contamination in fish are real."

Eating fish is definitely part of a healthy diet, but the risks from mercury contamination in fish are real. An infamous case of mass mercury poisoning occurred in Minimata Bay, Japan. In the 1950s and 1960s a nearby factory discharged high levels of wastewater containing mercury, which entered the bay and contaminated the fish and shellfish—both major sources of food for the residents. Many of them died or became seriously ill. Over 10,000 people were affected, and well over 2,000 were diagnosed with what came to be known as Minimata disease.

A much less dramatic but nevertheless significant source of mercury in our environment comes from dentistry. Of the 10,000 tons of mercury newly mined each year, about 2%-3% is used to make dental amalgam. When the dentist tells you to "rinse and spit," tiny bits of amalgam enter the wastewater stream. Sewage treatment plants are not designed to remove mercury, so most of it passes through into the rivers and harbors. The U.S. Environmental Protection Agency (EPA) estimates that over 5 tons of dental mercury reaches American waterways every year. In the late 1990s, it was estimated that up to one third of the mercury in the water of New York Harbor came from dentists' offices. Fortunately, it's easy and relatively inexpensive (under $1,000) for dentists to capture the mercury before it enters the sewage system. Nearly a quarter of the states in the U.S., with about 40% of American dentists, have required installation of such equipment.[7]

Over the past few decades, mercury has largely been phased out of common instruments such as thermometers and thermostats.[8] But even as less mercury is being used in such products, improper disposal of mercury batteries, fluorescent light bulbs, auto parts, older thermometers, etc., remains a pathway through which this toxin enters our environment.

Every few months, some unwitting child in the U.S. finds a vial or jar of this endlessly fascinating substance and can't resist playing with it, showing it to friends, bringing it to school and – inevitably – spilling it. The U.S. EPA spends hundreds of thousands of dollars annually to clean up these dangerous messes.

Regulation of Mercury in the U.S.

There are a variety of regulations governing the use and disposal of mercury, some focused on specific activities or products and others more generally applicable.

The Mercury Export Ban of 2008[9] is intended to reduce the availability of elemental mercury in both domestic and foreign markets. EPA describes the Act's main provisions as follows:

- Federal agencies are prohibited from conveying, selling or distributing metallic mercury that is under their control or jurisdiction. This includes stockpiles held by the Departments of Energy and Defense.
- Export of metallic mercury is prohibited from the US beginning January 1, 2013.
- The Department of Energy was required to designate one or more DOE facilities for long-term management and storage of metallic mercury generated in the U.S.; this designation began on January 1, 2010.

The Mercury-Containing and Rechargeable Battery Management Act of 1996 phases out the use of mercury in batteries and provides for their efficient and cost-effective disposal.

But the main event is under the Clean Air Act. As noted, air emissions from coal-fired power plants represent the largest single source of mercury in our environment.[10] Mercury is among the 188 "hazardous air pollutants" (also known as "air toxics") listed under Section 112 of the Clean Air Act (CAA),[11] which also authorizes EPA to establish emission standards for sources that emit these air toxics. After a failed effort at regulating mercury emissions from power plants during the previous decade, in early 2013 EPA set emission limits for new power plants

for mercury and a number of other pollutants. (The rule did not apply to existing power plants.)[12]

On December 27, 2018, EPA issued a proposed revised "Supplemental Cost Finding for the Mercury and Air Toxics Standards" and the associated "risk and technology review" required by the CAA.[13] In the Agency's words: "After taking account of both the cost to coal- and oil-fired power plants of complying with the MATS [mercury and toxics standards] rule (costs that range from $7.4 to $9.6 billion annually) and the benefits attributable to regulating hazardous air pollutant (HAP) emissions from these power plants (quantifiable benefits that range from $4 to $6 million annually), as EPA was directed to do by the United States Supreme Court, the Agency proposes to determine that it is not 'appropriate and necessary' to regulate HAP emissions from power plants under Section 112 of the Clean Air Act." This overturns a 2016 EPA rule finding that it is "appropriate and necessary" to regulate such emissions.

EPA goes on to note that under the December 2018 proposal, "[t]he emission standards and other requirements of the MATS rule, first promulgated in 2012 [sic[14]], would remain in place . . . since EPA is not proposing to remove coal- and oil-fired power plants from the list of sources that are regulated under Section 112 of the Act." EPA left those standards in place because so many power companies had already invested heavily in compliance.

Perhaps more importantly, the December 2018 proposal would change how EPA calculates certain health benefits of a regulation. Called "co-benefits," they are attributable to reductions in pollutants other than those that are the subject of a rule, but which occur as a tangential result of achieving compliance with the reductions required for the targeted pollutant. This represents a significant policy shift that may presage how other federal agencies will evaluate benefits.

EPA had estimated that while the mercury-from-power-plants rule would yield $4-$6 million in direct public health benefits, accompanying reductions in particulate matter and nitrogen oxide emissions would yield $37-$90 billion in co-benefits (reduced health costs, lost workdays, and preventing some 11,000 premature deaths and 4,700 heart attacks). The December 2018 proposal asserts it was inappropriate to consider those co-benefits. If finalized, the rule will almost certainly be challenged.

And what about hatters? In 1941 the United States Public Health Service banned mercury use in the American felt industry. By the second half of the 20th century the effects of mercury poisoning were well understood and widely recognized. And today, few people still wear the kinds of hats made of felt. Presumably, our remaining hatters are no longer going mad … at any rate, not from hatting. But we are all still being exposed to mercury.

Endnotes

1. Unlike most scholarly articles, this one is not heavily freighted with footnotes and citations. Among other reasons, the author is not a scholar. Much of the historical information presented here was sourced from the internet … so it must be accurate, right? The author has found that Wikipedia is generally a good place to start, and then follow up with some of the large number of other available references.
2. https://corrosion-doctors.org/Elements-Toxic/Mercury-mad-hatter.htm.
3. *See, e.g.*, https://corrosion-doctors.org/Elements-Toxic/Mercury-mad-hatter.htm and https://en.wikipedia.org/wiki/Merbromin.
4. Because fluorescent light bulbs have small amounts of mercury, they should be disposed of carefully as household hazardous waste. LED (light emitting diode) light bulbs do not use mercury; they also last longer, use less electricity, and provide a wider range of color and "feel" than fluorescent or incandescent bulbs.
5. Mercury vapor lamp ballasts were banned by the Energy Policy Act of 2005, with the ban taking effect in 2008. <https://www.govinfo.gov/content/pkg/BILLS-109hr6enr/pdf/BILLS-109hr6enr.pdf>.
6. *See, e.g.*, <https://www2.usgs.gov/themes/factsheet/146-00/>.
7. In December 2016 the U.S. EPA finalized a rule requiring dentists nationwide to capture amalgam residue. Shortly thereafter, in January 2017, the incoming administration withdrew the rule.
8. A summary of environmental laws and regulations affecting the use and disposal of mercury can be found at: https://www.epa.gov/mercury/environmental-laws-apply-mercury. Mercury is still used in some cosmetics and skin care products that are brought into the U.S. illegally; the Food & Drug Administration warns consumers against using these products. <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm294849.htm> The FDA writes: "[Y]ou should avoid skin creams, beauty and antiseptic soaps, and lotions that contain mercury. How will you know if mercury's in the cosmetic, especially one that's marketed as 'anti-aging' or 'skin lightening? Check the label. If the words 'mercurous chloride,' 'calomel,' 'mercuric,' 'mercurio,' or 'mercury' are listed on the label, mercury's in it—and you should stop using the product immediately. The products are usually marketed as skin lighteners and anti-aging treatments that remove age spots, freckles, blemishes, and wrinkles. Adolescents may use these products as acne treatments. … [the] FDA's Office of Regulatory Affairs says these products usually are manufactured abroad and sold illegally in the United States, often in shops catering to the Latino, Asian, African, or Middle Eastern communities. They are promoted online on social media sites and sold through mobile apps. Consumers may also have bought them in another country and brought them back to the U.S. for personal use…."
9. *See* <https://www.epa.gov/mercury/environmental-laws-apply-mercury> for a summary of this and other U.S. environmental laws applicable to mercury. Wikipedia also provides a good summary of mercury regulation: <https://en.wikipedia.org/wiki/Mercury_regulation_in_the_United_States#Airborne_releases>.
10. The U.S. is by no means the only—nor even the largest—emitter of mercury. China is by far the largest emitter; see, e.g., <https://pubs.acs.org/doi/full/10.1021/es503977y>.
11. 42 U.S.C. § 7412.
12. *See* < https://www.epa.gov/sites/production/files/2016-05/documents/20130328fs.pdf>.
13. *See* < https://www.epa.gov/mats/regulatory-actions-final-mercury-and-air-toxics-standards-mats-power-plants>.
14. The rule was to have been finalized in 2012, but was actually finalized in January 2013; *id.*, note #20.


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Microgrids: Legal and Regulatory Hurdles for a More Resilient Energy Infrastructure

By Raquel Parks

Natural disasters and climate change have made it apparent that energy infrastructure needs to be modernized. Microgrids are one type of technology that can help the electricity grid become more resilient, reliable, and efficient. Different states have begun developing microgrid pilot projects including California, New York, Connecticut, and Pennsylvania. The City of Pittsburgh, Pennsylvania is the first city to propose implementing "energy districts" of microgrids that will serve as critical infrastructure, in the first phase, and then expand to commercial and community settings. This large project involves many shareholders including public utilities, government agencies, and private entities. Using microgrids on a large scale raises issues regarding its classification—as energy generation or energy storage—and whether it should be regulated by public utilities, private entities, or municipalities. In a state like Pennsylvania, where the energy market has been deregulated, there is strong concern on what the public utilities involvement will be with microgrid projects.

This Note focuses on the regulatory issues that are raised with the construction and operation of microgrids at such a large scale in Pittsburgh. In addition, it addresses the difficulties that arise when implementing microgrids in a deregulated energy market state such as Pennsylvania, where little to no statutory language exists regarding microgrids. Further, it will give an overview of proposed Pennsylvania legislation that may impact a public utility's control over microgrid technology. Finally, it will outline the benefits and costs when examining the extent of the public utilities' role regarding ownership and control of microgrids in a deregulated energy market.

I. Introduction

As observable impacts of global climate change continue to increase in severity and as traditional energy infrastructure ages, the push towards renewable forms of energy has never been greater. Society has evolved—outstripping the existing electrical infrastructure, often referred to as the "traditional grid," rendering it obsolete.[1] Not only is current electrical technology outdated, but it is unable to withstand the stresses of more powerful and frequent weather events, causing widespread power outages.[2] Recently, the influx of extreme, and often disastrous, weather events has encouraged legislators and policymakers to focus on implementing technology that will enhance resiliency to existing infrastructure.[3] Specific federal policies have been enacted to address decreasing reliability of the traditional grid and rising damage mitigation and repair costs that result from grid instability.[4] Arguably, these policies also reflect a response to the trends seen in the last decade of traditional energy sources such as the decline in oil imports, decrease in coal production, and the rise in natural gas production.[5]

As a potential means to modernize energy infrastructure and strengthen the grid's reliability, resiliency, and efficiency, Congress introduced the idea of the "Smart Grid"[6] through the Energy Independence and Security Act of 2007.[7] The Smart Grid enhances the existing electrical system by using sensors, controls, "advanced metering systems," and other technologies[8] that enable "real-time sensor data, weather information, and grid modeling."[9] This new technological approach can provide "rapid information about blackouts and power quality[,] as well as insights into system operation for utilities."[10] In contrast, under the existing "traditional grid" system, there are slow response times when blackouts or brownouts occur, with even short blackouts having strong fiscal impacts on the affected regions.[11]

The advent of smarter technology allows for the integration of a microgrid, which is defined as "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid."[12] The market for microgrid technology is expected to expand in the future, but efforts must be taken to address the obstacles associated with implementing a new energy storage and generation paradigm.[13]

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This Note discusses the benefits of shifting toward an electrical infrastructure system that uses microgrid technology and addresses the risks and barriers that such technology will face in policymaking and implementation. Part II provides an overview of microgrid technology and discusses how they transform existing infrastructure by improving reliability and resiliency. Part III discusses the history of the technology's implementation and examines successfully executed microgrid pilot projects throughout the United States. Part IV highlights risks and regulatory issues that will likely affect implementation of microgrids[14] by examining Pittsburgh's innovative plan to develop energy districts, referred to as a "grid of microgrids," as a solution to aging infrastructure. Finally, Part IV addresses the extent of the role that public utilities can play in controling microgrid technology, as well as the potential risks associated with the lack of policy regulating microgrid implementation.

"Microgrid technology allows for either functioning as a separate system from the utility grid that powers the area or continuous system connection with the central grid."[19]

II. Benefits of Microgrids: A Smart Grid Technology

Microgrids are a form of Smart Grid technology that is considered the "ultimate implementation of smart grids" due to its ability to adapt and disconnect from the central grid[15] and function independently as a "power island."[16] Generally, a microgrid remains connected to the central grid However, under normal operating conditions, it is able to disconnect from the central grid when power is interrupted and will go into what is referred to as "island mode" operation.[17] Therefore, consumers connected to the microgrid are able to continue receiving power undisturbed through the microgrid's own frequency and voltage.[18] Microgrid technology allows for either functioning as a separate system from the utility grid that powers the area or continuous system connection with the central grid.[19] When connected or disconnected from the central grid, microgrids can use a combination of power sources. These include but are not limited to batteries, fuel cells, solar, and wind energy.[20] Currently, the dominating power source tends to be diesel through traditional combined heat and power (CHP) and natural gas. Yet, a progression towards utilizing renewable energy sources has expanded in recent years.[21]

The goals of a microgrid are similar to those of a smart grid in that microgrids seek "to maximize services provided by generation and storage assets through embedded intelligence, while dramatically boosting efficiencies, thereby minimizing costs."[22] However, microgrid implementation employs a bottom-up approach, focusing on potential solutions from the customer's end, rather than a top-down approach, which is used by the Smart Grid, and employs strategies targeting the central grid.[23] The bottom-up approach provides a greater benefit to the end-use customer because the microgrid allows for more flexibility, catering specifically to the customer's needs.[24] Through the bottom-up approach, microgrids enhance energy infrastructure reliability by disconnecting from the centralized grid when there is a system failure, thus preventing power disruption.[25]

While reliability focuses on strategies to minimize power outages for users, resiliency is concerned with avoiding the outages altogether.[26] "Resiliency is determined by measuring both the functionality of the system during an event that could disrupt service and the ability of the system to recover if service is interrupted."[27] Measuring resiliency is less challenging when the microgrid is located on a single property, with a single owner, and only one electric meter storing the data.[28] Improvement in technology has allowed for microgrids to move to a multi-user area, but this has added complexities that need to be addressed through regulatory and statutory schemes.[29]

III. Early Cases of Successful Microgrid Projects

Early cases of successful microgrid projects are located in sectors such as hospitals, universities, schools, and municipalities.[30] This success can be attributed to factors such as structural design benefits, the ability to handle the increased energy usage, appropriate load balancing that results in ease of control under a single owner, and ease of funding for the projects.[31] The projects discussed in this Part exhibit factors discussed above and can serve as building blocks for larger projects to mirror as more complex and larger microgrids are developed.

A. University of California, San Diego (UCSD) Microgrid

The microgrid at University of California, San Diego (UCSD) is one of the most advanced in the country.[32] The UCSD microgrid supplies electricity and heating to a 450-hectare campus and utilizes Smart Grid analytics to produce, distribute, monitor, and store energy, analyzing the data to make energy more efficient and reduce cost.[33] The microgrid technology consists of gas turbines, steam,

and solar-cells that supply "85% of campus electricity needs, 95% of its heating, and 95% of its cooling."[34] This setup "reduces the demand" placed on the centralized grid and allows San Diego Gas and Electric (SDG&E), the local utility serving the area, to "further expand their transmission and distribution system (T&D)."[35] By diversifying its energy storage, making improvements on traditional energy resources, and using renewable sources UCSD's microgrid system provides a noteworthy example of the microgrid's ingenuity and contribution to greenhouse gas emissions reductions.[36]

B. Philadelphia Navy Yard Microgrid

The Navy Yard in Philadelphia offers another example of how a successful microgrid can function.[37] The Navy Yard, a former military base, is now a 1,200-acre commercial urban development property that was conveyed to the Philadelphia Authority for Industrial Development (PAID).[38] Philadelphia Industrial Development Corporation (PIDC) is a public-private economic development corporation that oversees microgrid project implementation on the site on behalf of PAID.[39] Historically, the Navy Yard had its own electric distribution grid that PIDC retained when the site was decommissioned as a shipbuilding facility, making the infrastructure ideal for microgrid development.[40] PIDC began to make energy infrastructure updates at the Navy Yard in 2014, focusing on implementing Smart Grid and distribution generation technologies through partnerships with corporations, institutions, and some private sector companies.[41] In March 2016, the U.S. Department of Energy (DOE) even selected PIDC's site for a pilot study program on "new technology for advanced electrical distribution and controls."[42] This program aligns with PIDC's goal of improving the management of power delivery through testing of a new control technology called micro-Phasor Measurement Units (micro-PMUs).[43] On a local scale, the micro-PMUs will give real-time data analytics being used on a commercial functioning microgrid.[44] As this technology is fine-tuned, it has the potential to be successfully implemented into future microgrid projects.

Uniquely, the Navy Yard is not subject to Pennsylvania's utility regulations because it has its own electrical distribution grid.[45] Under Pennsylvania law, the Navy Yard is not considered a public utility so long as PIDC does not sell electricity outside of its borders.[46] As a result, the Navy Yard is not regulated by the Pennsylvania Utility Commission (PUC), allowing PIDC to set its own rates and to make alterations to grid infrastructure without PUC's approval.[47] This situation is ideal for implementation of microgrids as PIDC enjoys the opportunity to experiment with technologies in efforts to further its green initiatives without being constrained by PUC requirements.[48]

C. State Initiatives in the Aftermath of Hurricane Sandy

1. Connecticut

Following the devastating infrastructure damage and power outages caused by Hurricane Sandy, Connecticut established a statewide microgrid program to improve the State's future electric infrastructure resiliency.[49] In response to the catastrophic event, the Connecticut General Assembly passed a statute authorizing the state to give grants to local municipalities, allowing them to fund the development of microgrids that will serve as a back-up when power outages occur.[50] These community-based microgrids connect to a centralized grid but, in the event of a power outage, the microgrid can continue to generate power for small areas, such as schools, libraries, and gas stations.[51]

2. New York

New York also responded to Hurricane Sandy's devastation in a proactive way through Governor Andrew Cuomo's program, "Reimagining New York for a New Reality," which is "aimed at extreme weather resiliency and response."[52] This program is currently referred to as Reforming the Energy Vision (REV). The program came in the form of a $40 million grant to aid in constructing multiple community-scale microgrids, promoting third-party owners.[53]

The Brooklyn Microgrid is an example of a successful project that came out of Governor Cuomo's program.[54] The Brooklyn Microgrid is set up as "peer-to-peer energy trading system" in which solar panel arrays are placed on rooftops of buildings, interwoven into a network where residents and third-party businesses can opt in to participate in trading energy credits amongst themselves.[55] This caters specifically to the needs of the consumers by allowing community members to identify personal energy demand.[56] Brooklyn's Microgrid Project is off the centralized grid and functions on its own in the event of power outages.[57] New York General City Law permits the local legislature to enable this type of project by allowing the City to "grant franchises or rights to use the streets, waters, water front, public ways and public places of the city," furthering New York City's goal towards more resilient and independent infrastructure.[58]

IV. Risks and Regulatory Issues When Implementing Microgrids on a Larger Scale

While Connecticut and New York have begun to employ various microgrid initiatives by weaving language relating to microgrids into state and local law, many complex regulatory issues and risks related to microgrid implementation have yet to be addressed. Recent microgrid initiatives in Pittsburgh, Pennsylvania provide an overview of the various issues that can arise when local officials attempt to implement microgrid technology on a city-wide scale.

A. Pittsburgh's Energy Vision

In the 1980s, the City of Pittsburgh (City) was victim to the steel industry crash. Subsequently, the City lost a large percentage of its population.[59] This population decrease, combined with detrimental health effects due to poor air quality, injuries, and fatalities associated with dated infrastructure, have since motivated local and state officials to take measures to improve the City's health, economy, and quality of life for residents and workers of Pittsburgh.[60]

In December 2015, the U.S. Department of Transportation (DOT) launched a "Smart City Challenge" in which the agency called for mid-sized cities to submit new and creative solutions to address the many challenges facing city transportation infrastructure.[61] In response, the City submitted a project proposal, referred to as Energy Vision, "to create the next generation of public infrastructure," described as "an adaptive, living communication and data platform that allows the City . . . to respond to the transportation and energy needs of residents efficiently and equitably."[62] To effectuate this vision, Pittsburgh implemented "SmartPGH" which integrates existing networks with what the plan calls a "system-of-systems" (SoS) approach.[63] The Energy Vision will foster collaboration between major transportation, energy, and communication players towards implementing the future infrastructure. Notably, an important piece of the Energy Vision is the distribution of energy districts[64] via microgrids.[65]

Pittsburgh is an ideal city to employ a grid of microgrids, the first of its kind, because it contains the requisite foundational infrastructure.[66] This is exhibited through the five actively operating distributed energy systems within the city. For example, the Duquesne University's Cogeneration plant and the NRG Pittsburgh site, which will serve as the framework to execute Pittsburgh's Energy Vision.[67]

Pittsburgh's Energy Vision began with a Memorandum of Understanding (MOU) between the National Energy Technology Laboratory (NETL) and the City.[68] The City's Energy Vision includes the creation of a network of small-scale, distributed energy systems that will be separate from the centralized grid, come from a variety of energy sources, and use multiple kinds of "advanced distributed energy sources such as microturbines, . . . DC power delivery, combined heat and power (CHP), reciprocating engines, fuel cells, energy storage devices (*e.g.*, batteries), advance power electronics, photovoltaics, and wind turbines."[69] Initially, the grid will serve universities, hospitals, critical infrastructure, and data centers. In later phases, it will connect "commercial and community/utility capacities."[70] Local energy systems already in place in Pittsburgh will be used as the foundation for microgrid development and to facilitate the organization of communities into energy districts.[71]

While many projects are still in the conceptual and planning stages, University of Pittsburgh's Energy GRID (GRID) Institute has taken the lead on the research and development components of the Energy Vision and are currently participating in major projects that are finding technological solutions for a successful grid of microgrids.[72] GRID has partnered with a local utility company, Duquesne Light, to build a 3-megawatt microgrid on Duquesne's Woods Run campus with plans to use wind and solar power, in combination with natural gas, as its main fuel sources.[73] The completion of GRID's state-of-the-art, utility-scale Electric Power Technologies Lab at the Pittsburgh Innovation Center will enable GRID to advance its research on energy systems, engage more community organizations, and receive participation from industry.[74] University of Pittsburgh is working on funding for a 30-megawatt campus-wide microgrid which will serve its 132-acre campus. that includes University of Pittsburgh Medical Center facilities.[75]

"A project executed on a city-wide scale may provide a blueprint for other cities' future microgrid development. However, this type of microgrid development raises issues regarding state and local regulation."

The five energy systems that already exist throughout the City and will serve as the groundwork for future microgrid development include: Pittsburgh Allegheny County Thermal (PACT), which will support the Downtown Energy District; Duquesne University's Cogeneration Plant, which has potential to support the Uptown Energy District; NRG Pittsburgh site, which will support the Northshore Energy District; Bellefield Boiler Plant, which has the potential to support the Oakdale Energy District; and Carrillo Steam Plant in Oakland, which has the potential to support the Oakland Energy District.[76] Additionally, there are distributed energy and microgrid projects that are currently in development.[77] Microgrids placed throughout the City will serve key local amenities such as the Pittsburgh Medical Center and other major institutions.[78]

B. Pennsylvania Legislation Shaping Policy for Microgrids

A project executed on a city-wide scale may provide a blueprint for other cities' future microgrid development. However, this type of microgrid development raises issues regarding state and local regulation. In 1996, following national trends, the Pennsylvania legislature enacted the Electricity Generation Customer Choice and

Competition Act (Act) in efforts to deregulate the energy market, promote energy efficiency, and expand the use of renewable energy.[79]

The Act broke up the monopolies that utilities had on the energy market, separating the market into two categories: "electric generation suppliers" (EGSs) and "electric distribution companies" (EDCs).[80] In Pennsylvania, EGSs are not regulated by the State PUC and, therefore, these electric supply companies are able to set less-expensive rates than their EDC counterparts, providing customers with the opportunity to choose cheaper energy suppliers.[81] The Act also capped "costs, generation, transmission and distribution rates . . . at 1996 levels[,]" which were set to expire on December 31, 2009.[82] EDCs were required to purchase their electricity from independent generators which encouraged wholesale market competition.[83]

Following the Act, Pennsylvania lawmakers enacted the Alternative Energy Portfolio Standard Act (AEPSA) to "promote conservation and environmental stewardship by reducing reliance on traditional sources of electric generation" with the ultimate goal being diversification of energy sources.[84] AEPSA required Pennsylvania utility companies to purchase a set amount of power from alternative sources such as solar, wind, and biofuels.[85] Accordingly, PUC established an alternative energy credits program pursuant to AEPSA.[86] Under AEPSA, EDCs can either produce the energy credits from solar voltaic technologies or buy the credits as a tradable instrument.[87] EDCs are required to purchase a set amount of these credits and submit documentation to establish proof of compliance with the program.[88]

Net metering is also a concept that was introduced after AEPSA was implemented, whereby customers are able to sell back unused energy to the EDCs.[89] However, Pennsylvania legislators prematurely implemented these renewable energy policies before evaluating potential negative effects it could have on their solar energy market.[90]Therefore, these laws caused problems because EDCs increase their revenue by selling electricity.[91]

They set rates for their electricity that are established under ratemaking cases[92] and cannot be increased except during the ratemaking process.[93] Thus, EDCs are *sale driven* by the increased electricity they sell *(emphasis added)*.[94] As electricity from distributed generation comes into the picture and customers do not require electricity from the EDCs, their revenue is reduced.[95] Pennsylvania EDCs have little incentive to become involved in electricity from distributed generation technology, like microgrids, if they are not going to make a profit because most of these companies are investor-owned utilities.[96]

C. Lack of Statutory Language to Clarify Whether a Microgrid Is a Distribution Service or a Form of Energy Generation

How microgrids are classified resulted in underinvestment in the technology.[97] Ultimately, how microgrids are classified dictates how it should and will be regulated.[98] There is no certainty as to whether microgrids are considered traditional utilities or conventional distributed energy resources (DER) and, in Pennsylvania, microgrid structure is not defined.[99] Consequently, the category under which a microgrid may fall can depend on the project for which it is being implemented.[100] If the microgrid is classified as a form of energy generation—for example, a "package of services"—then it operates in the competitive private sector.[101] Conversely, if it is classified as part of the distribution system, it is treated as a utility and regulated by the PUC.[102] Currently, if a microgrid is defined as a "public utility," it may be subject to legal challenges because there is no clarification within Pennsylvania law as to whether a microgrid is considered distribution or generation.[103]

Currently, the closest term that relates to a microgrid in Pennsylvania is a "customer-generator."[104] If a microgrid is classified as a "customer-generator," participation in net metering and receiving AEC would be permitted.[105] In other states, such as California, New York, and Connecticut, state law allows for particular exemptions for other entities similarly defined as a "customer-generator," including electric corporations.[106] If a microgrid owner is not considered an electric distribution utility, then it will not be subject to a ratemaking case nor additional approvals as required under the designated state PUC.[107] When the microgrid is not bound by the PUC, it may be subject to distribute the energy in a limited scope and authority.[108] The uncertainty of how to define a microgrid can clearly impact the type of revenue generation and customer/owner incentives.[109]

As Pittsburgh's Energy Vision exemplifies, microgrid projects involve numerous stakeholders, so policies must clearly establish which parties are responsible for managing various elements of microgrid systems. This involves determining which entity will be liable for microgrid system failures and malfunctions. There is no clear statutory or regulatory language that specifies how limited a particular company's liability may be in regard to the microgrid, especially if the microgrid is not classified as an electric distribution utility. Large-scale microgrid projects, such as Pittsburgh's Energy Vision, will likely include third-party involvement, either through the technology generating energy from the grid or analytics. Legal battles may ensue down the line if a particular company's duties towards the microgrid are not spelled out, but the company is ultimately held responsible for problems with the microgrid.

D. Attitudes Toward Public Utility's Role in Microgrid Pilot Projects

The role that public utilities play in the deregulated energy market adds complexity to the debate about ownership control over the microgrid. PUCs have been cautious to grant utility companies full ownership control over microgrids. The following proposals by utility companies in Pennsylvania and Maryland, both states with deregulated energy markets, will illustrate.[110]

On May 18, 2016, PECO Energy Company (PECO), a large EDC in Pennsylvania, submitted a petition before PUC to approve its Microgrid Integrated Technology Pilot plan. Also, it requested a declaratory order to recover the costs for the microgrid.[111] In its plan, PECO proposed to "build, own, and operate" a community microgrid in Concord Township, Pennsylvania, for the purpose of "enhanc[ing] system reliability, resiliency and security as envisioned under [PECO's] electric Long-Term Infrastructure Improvement Plan (LTIIP)."[112] PECO also proposed to construct two integrated microgrids that would be capable of providing "power to three government facilities and 27 public accommodations."[113] Further, PECO asserted that the microgrids would be connected to the main grid and would be capable of operating in "island mode," which PECO anticipated would occur approximately 28 hours per year.[114]

Per PECO's petition, after constructing the microgrid, it planned to seek recovery of the costs "not recoverable through its electric Distribution System Improvement Charge (DSIC) in a future distribution base rate case" by splitting up the cost to all of its customers.[115] The DSIC is "a surcharge on customers' bills to accelerate the replacement of existing aging facilities that otherwise will occur if the utility must wait until the completion of a rate case to begin receiving a return on its investment."[116] PECO argued that because the pilot program furthers the development of technology on a larger scale, all of its customers would benefit from it.[117] PECO's petition to build, own, and operate its own microgrid, and to additionally recover the costs from its customers, is a new idea that has yet to be addressed in the State of Pennsylvania.[118]

PUC provided a public comment period for interested parties to weigh-in on the Microgrid Integrated Technology Pilot. The project was met with significant backlash.[119] Industrial, retail, and private investment companies voiced a number of concerns relating to the project's "cost-effectiveness, capabilities, proposed cost recover, and compliance with the provisions of the Pennsylvania Public Utilities Code."[120] According to an expert witness, Matthew White, on behalf of the Retail Energy Supply Association (RESA), permitting PECO to own the power generation of a microgrid would be defined as a "utility owned DER" and would conflict with Pennsylvania's policy of unbundling the EDCs and EGSs.[121] Mr. White argued that this would slow down the development of DERs in Pennsylvania, and private companies would not be compelled to invest in this type of DER.[122] In addition, he testified that repercussions would occur in the future when PECO is guaranteed the full cost of recovery from its ratepayers. Further, PECO would be influenced to build DERs even when it does not make sense with the current market.[123] This could put an increased burden on the ratepayers.[124] RESA opposed PECO's argument to qualify DERs as distribution costs and, instead, argued that DERs are generation costs that should not be distributed among customers.[125]

On October 27, 2016, due to these interested-party concerns and objections, PECO withdrew its petition, stating that it wanted to work collaboratively with its stakeholders to better address the issues brought up during testimony in order to develop improved microgrid technology in the future.[126] PECO's "novel plan" was the first in Pennsylvania to demonstrate the complexity of public-utility owned microgrids in a deregulated energy market state.[127]

Similar concerns were addressed when Baltimore Gas and Electric (BG&E) presented to the Maryland Public Service Commission (PSC) a plan to build, own, and operate a public purpose microgrid.[128] Maryland is also a deregulated energy market state, and BG&E proposed to recover the cost of this project by monthly billing of its customers "through a new microgrid rider to BGE's Electric Service Tariff."[129] Privately owned retail energy companies such as IGS Energy and NRG Energy expressed similar concerns for BG&E's proposal to those of RESA in response to PECO's petition for a microgrid. If this proposal were to pass, it would work against the idea of deregulated ESGs decreasing the incentive for private investment.[130] Although the Maryland PSC ultimately rejected the proposal, the State's concerns focused primarily on substantive aspects of the proposal, concentrating less on the potential policy repercussions of an EDC controlling generation.[131] Their main concerns included:

> (1) whether particular needs of the location and customers were really considered since there was a lack of input from the customer and county where the project was going to be placed and if this type of project would best serve that particular community;
>
> (2) there was no contemplation of renewable energy options where the "Proposal [did not] capture the full breadth of potential benefits that public purpose microgrids could offer through fuel-diverse generation";
>
> (3) although BG&E argued that customers would still have retail choices for the energy suppliers, when the microgrid would go into island mode, customers would be obligated to "BG[&]E's Stan-

dard Offer Service" and thus have no access to other options.[132]

Essentially, the Commission asserted that the proposal was premature and, although its attitude was not negative towards allowing an EDC to own an ESG, the method that BG&E chose to attempt to recover costs in this proposal would not benefit the community.[133]

E. Proposal of House Bill 1412: Amendments to Restructure the Electric Utility Industry

To clarify some of the public utility owned EGS problems discussed above, House Bill 1412 (H.B. 1412), a bipartisan bill, was introduced to the Pennsylvania legislature on May 9, 2017.[134] The bill is supported by large public utility companies of the region, like PECO, who are heavily involved in Pittsburgh's Energy Vision.[135] H.B. 1412 would allow public utilities to build public purpose microgrids that serve a "societal role, such as protection of power supplied to water, police, hospitals, communications and other critical services during an emergency."[136] Specifically, H.B. 1412 serves the public interest by "facilitat[ing] the diversity of electric supply options, including the addition of distributed energy" and by "enhanc[ing] the grid's electric distribution, resiliency and operational flexibility."[137]

Main arguments for public purpose microgrids revolve around the idea that in the event of a natural disaster, such as a hurricane, if the centralized grid goes down, the microgrid can kick in and provide energy to the surrounding community.[138] In addition, a growing number of lawmakers argue that public purpose microgrids can aid in combating cyber terrorism in that the microgrid would function as a back-up power source in the event of a cyber attack on the centralized grid.[139] Further, H.B. 1412 would allow utilities to recover rate costs for microgrids if they are "reasonable, prudently incurred expenses to operate and maintain the facility."[140] So long as expenses meet this standard, the provision provides public utilities with an incentive to build microgrids in areas where customers have low-electric reliability, knowing they can recover costs.[141] However, under H.B. 1412, cost recovery would be available only after a PUC performance review of the PUC-approved pilot projects.[142]

These benefits to public utilities would be possible because Title 66 of the Pennsylvania Consolidated Statutes would be amended by adding language defining "microgrid," "pilot programs," "energy storage," among other terms related to distribution and generation energy resources.[143] Notably, under section 2816(c), the amendment defines "recovery" and states that "an electric distribution company shall be permitted to recover in the electric distribution company's distribution rates . . . a pretax on, and a return of, the original cost of an energy storage facility or microgrid constructed . . . and the reasonable, prudently, incurred expenses to operate and maintain the facility."[144] These amendments provide the PUC with full discretion to approve the microgrid pilot program and to thereafter "determine the circumstances under which the ownership, development, and deployment of energy storage and microgrids by electric distribution companies may be in the public interest."[145]

EDCs such as PECO, Duquesne Light, and others are backing H.B. 1412, as it would provide these companies with more control over DERs.[146] The bill may be a solution to reverse the negative impacts that the Alternative Energy Portfolio Standard Act had on its state EDCs, including loss of revenue and decrease in investment.[147] However, other industries have asserted the opposite.[148] For example, RESA opposed the bill and argued that it is unnecessary for utilities to develop microgrids because the private sector can be relied on to build them. RESA contended that allowing utilities rate recovery would inhibit the private sector's ability to compete.[149]

"Main arguments for public purpose microgrids revolve around the idea that in the event of a natural disaster, such as a hurricane, if the centralized grid goes down, the microgrid can kick in and provide energy to the surrounding community."[138]

Similar arguments made in PECO's initial petition for construction of their public purpose microgrid also apply here.[150] H.B. 1412 defines a microgrid as "[a] group of interconnected loads and distributed energy resources . . . that acts as a single controllable entity with respect to an electric distribution company's distribution system . . . and operate either connected to the distribution system or in island mode."[151] This explicitly defines a microgrid being connected to an EDC distribution system, thus enabling a microgrid to be regulated by PUC.[152] Such regulation of the microgrid would allow public utility companies, like PECO, to build microgrids with a guarantee of a return of its investment via their customers.[153] However, this approach may result in unexpected costs that can overburden the customer that is not reaping the benefits of the microgrid.[154]

Further, RESA's expert witness, Mr. White, argued that in a competitive-private market, the only customers that are going to share the burden are those actually benefiting from the service. Therefore, more strategic investment and building will occur.[155] This means that the projects will likely be smaller, more economically efficient, and lower in cost than if the microgrid was built

by its public utility counterparts.[156] Although it is within the public interest for PUC to act as the gatekeeper in approving a utility's pilot program, this puts less incentive for private DER developers to pursue microgrid projects when there is a greater chance that the utilities will have reasonably and prudently incurred expenses covered.[157] However, the utility would be incentivized to build more if the only way for them to make a return on their investment is by the size of the project.[158]

Pittsburgh Energy Vision has attracted private DER companies to participate as there are opportunities for investment in un-tapped markets.[159] Continuing deregulation of electricity generation would promote a competitive market for these companies and would provide customers the freedom to choose pricing.[160] Statistics have shown that the deregulation of the Pennsylvania electricity market has had a positive impact.[161] However, research conducted at the Pennsylvania Utility Law Project concluded that low-income customers enrolled in assistance programs paid more for the competitive market than they would have had they remained with the default utility company options.[162]

Under the Electricity Generation Customer Choice and Competition Act, EDCs may create customer assistance programs (CAP) that allow low-income customers affordable utilities.[163] To enroll in the program, residents must have a total "household income at or below 150 percent of the federal poverty guidelines [and must] have demonstrated an inability to afford their utility bills without assistance."[164] In effect, due to the deregulation of electric generators and distributors, CAP customers are only required to pay a fixed amount to the EDC. Subsequently, the EDC recovers the rest of the cost through its non-CAP customers. This difference is referred to as the "CAP discount."[165] Conversely, the EGS receives its full payment from the EDC regardless of the price that CAP customers pay for the generation.[166] Portions of CAP customer bills are "paid by other residential ratepayers through CAP."[167] When a CAP customer pays more than the utility price through a competitive supplier, non-CAP customers must absorb this cost, resulting in increased prices due to the cost recovery setup of the EDCs.[168]

To minimize the financial burden on its non-CAP customers, PECO proposed a "price ceiling" on CAP prices that would require an agreement from ESGs. To participate as CAP suppliers, ESGs must "charge a rate for electricity supply to CAP customers that is at or below PECO's . . . 'price ceiling.'"[169] However, PUC rejected the CAP ceiling proposal.[170] On behalf of PECO CAP customers, the Coalition for Affordable Utility Services and Energy Efficiency appealed PUC's rejection. However, the Commonwealth Court of Pennsylvania concluded that the Customer Choice and Competition Act does not grant PUC the authority to limit prices charged by the ESGs.[171] Additionally, the court noted that placing a ceiling on the CAP prices would limit customers' ability to choose and stated that a "clear and effective customer education program will create an environment where . . . CAP customers will actively seek shopping opportunities that could provide them savings or additional benefits over continuing to receive default services from PECO."[172]

Consideration of the financial impacts on low-income customers is an important factor that the Pittsburgh Energy Vision must consider. While additional resources have been adopted to further assist those involved in customer assistance type programs, if the implementation of microgrids falls within the realm of deregulated ESGs, lower-income customers may continue to experience negative financial impacts.[173] While there is Pennsylvania statutory language that ensures "assist[ance for] low-income customers to afford electric service," this power is given to PUC, meaning, in order for the assistance to be provided, the electricity source needs to be one that can be regulated by the Commission.[174] The City of Pittsburgh's Energy Vision calls for a collaborative effort between the City, private companies, retail companies, public utilities, and institutions.[175] However, what needs to be taken into consideration is where decision-makers will lie in regard to the competitive wholesale power markets. Policymakers and legislators that maintain loyalty to the traditional utility business model will dictate how the microgrids are managed.

Similar to one of Connecticut's approaches to microgrid development, Pennsylvania could establish state subsidies to fund municipal construction and implementation of microgrids.[176] Although DOT awarded Pittsburgh a federal grant, the grant can only be used specifically for transportation costs regarding the City's "SmartPGH" plan.[177] Additional state subsidies could be geared more towards the balancing cost for low-income qualifying residents, ensuring they get equal benefits while not impacting the cost of the utility price itself. Private companies, like NRG Energy, are striving to keep the energy market deregulated and are against utilities subsidies. However, there could be strict oversight by PUC to ensure that the subsidies are not discriminatory towards low-income customers.

As other states, like New York, have demonstrated, there is a growing shift away from the traditional utility business model as developing energy infrastructure moves to more renewable resources.[178] Competition in the wholesale power market has shown that there is success in moving away from the traditional utility business model. Rather than trying to mold the traditional model of centrally controlled energy to fit new technology, Pennsylvania should adapt with the new technology and implement the bottom-up approach. This would give the customer more control on the individual microgrid level and employ community-based collaborative development into the State's energy regulations.[179] Moreover, such an approach gives more opportunity to move towards renewable energy sources because large power plants

would not have the incentive of furthering the traditional energy sources, like coal and nuclear power. Rather, they would be forced to compete with private companies that are moving towards cleaner energy.

RESA proposed that H.B. 1412 be modified to allow for utilities, suppliers, consumer advocates, and others to collaborate in efforts to generate a greater benefit to the end user and increase transparency.[180] If utilities are unable to recover rates and more microgrids are employed using "intentional islanding," utility companies will continue to lose revenue and society will witness the dissolution of the utility business model.[181] With little language in Pennsylvania law addressing microgrids, this is an opportune time to shape where the State's energy industry will lead.

V. CONCLUSION

This Note has highlighted complexities that microgrids encounter in supporting a more reliable, resilient, and efficient energy infrastructure. As legal and regulatory frameworks develop around this innovative infrastructure, focusing on the role that public utilities are going to play is key. Main concerns associated with municipalities' integration of microgrid infrastructure have been illuminated by the Pittsburgh Energy Vision. Pittsburgh has more power in their hands than expected. Keeping a close eye on the policies that ultimately roll out from this project is necessary because this may shape the direction that other green district projects across the country will pursue in the future.

Endnotes

1. Kevin B. Jones et al., *The Urban Microgrid: Smart Legal and Regulatory Policies to Support Electric Grid Resiliency and Climate Mitigation*, 41 Fordham Urb. L. J. 1694, 1698 (2015).
2. *Id*. at 1699–1700.
3. *See id*. at 1701.
4. *See id*.
5. *See* Joseph P. Tomain & Richard D. Cudahy, Energy Law in a Nutshell 55 (3d ed. 2017).
6. *Grid Modernization and the Smart Grid*, U.S. Dep't of Energy. A Smart Grid uses "cutting-edge technologies, equipment, and controls that communicate and work together to deliver electricity more reliably and efficiently." *Id*.
7. Jones, *supra* note 1, at 1701.
8. Jim Lazar, Electricity Regulation in the US: A Guide (Second Edition) 168 (2016).
9. U.S. Dep't of Energy, Enterprise Transition Plan 14 (2011), https://perma.cc/CX2K-WSPT.
10. *Id*.
11. President's Council of Econ. Advisers & U.S. Dep't of Energy, Economic Benefits of Increasing Electric Grid Resilience to Weather Outages 3, 7 (2013), https://perma.cc/9Q2Y-X7WL. DOE statistics estimate that between 2003 and 2012, power outages in the United States cost the economy an average of $18 to $33 billion. *Id*. at 3. In years where major storms occurred, like Hurricane Ike in 2008, that cost increased from $40 billion to $75 billion, and similarly in 2012 when Superstorm Sandy hit, costs ranged from $27 billion to $52 billion. *Id.*
12. Jones, *supra* note 1, at 1697.
13. Robert Walton, *Navigant: Solar-plus-storage microgrid adoption 'more than just a fad,'* Utility Dive (Jan. 10, 2017), https://perma.cc/7LPX-GY2N. In 2016, "GTM Research estimated there were 156 operational microgrids in the country, making up 1.54 GW of capacity, and that number is expected to rise to 3.71 GW by 2020." *Id.*
14. City of Pittsburgh, PA, Beyond Traffic: The Smart City Challenge 23 (2016), https://perma.cc/9CFC-YWPJ [hereinafter Pittsburgh Vision Narrative].
15. The traditional utility infrastructure where the source for power generation comes from a centralized distribution facility. *See* Elisa Wood, *What Is a Microgrid?*, Microgrid Knowledge (Aug. 21, 2017), https://perma.cc/53DV-BRLW.
16. Jones, *supra* note 1, at 1702–03 (defining a power island as "an energized section of circuits separate from the larger system").
17. *Id.* at 1697.
18. *Id*. at 1702–03.
19. *Id*. Microgrids are capable of standing alone, or there can be multiple microgrids connected to one another. *Id*. at 1703.
20. *Id*. at 1712.
21. Jones, *supra* note 1, at 1704. The European Union and China are leading contributors in renewable energy projects, behind the United States. Amjad Ali et al., *Overview of Current Microgrid Policies, Incentives and Barriers in the European Union, United States and China*, 9 Sustainability 1, 2 (June 2017), https://perma.cc/F24L-YDFY. The EU has employed multiple directives to reach its energy goal so that by 2020, 20% of its energy consumed will be through renewable sources. *Id*. at 5. China's 12th Five-Year Plan highlights its goal for increasing renewable energy source consumption of "11.4% of its primary energy from non-fossil sources in 2015 and 15% in 2020." *Id*. at 13.
22. Peter Asmus, Microgrids: *Friend or Foe for Utilities?*, 153 Pub. Util. Fort. 18, 19–20 (2015).
23. *Id*. at 20.
24. *Id*.
25. *Id.* at 20–21.
26. Jones, *supra* note 1, at 1747.
27. *Id.*
28. Dan Leonhardt et al., Pace Energy & Climate Cent., Microgrids & District Energy: Pathways to Sustainable Urban Development 5 (2015), https://perma.cc/6X9Q-7LBQ.
29. *See infra* Part IV.
30. Emmett Envtl. L. & Pol'y Clinic, Massachusetts Microgrids: Overcoming Legal Obstacles 6 (2014), https://perma.cc/M3SN-LLHX [hereinafter Massachusetts Microgrids].
31. *Id.* at 6–7. The structural design benefits result from the fact that these projects tend to be located in clusters of buildings. *Id.*
32. Jones, *supra* note 1, at 1705. UCSD has a partnership with the local utility company, San Diego Gas and Electric (SDG&E) and "uses engineering and [IT] firms to test and implement state-of-the-art technology." *Id.* at 1705–06.
33. *Id*. at 1707–08.
34. *UCSD*, Berkeley Lab, https://perma.cc/TC7S-XZ89.
35. Jones, *supra* note 1, at 1709. "[T]he school also saves more than $800,000 a month when compared to buying all of its energy from the grid" *Id*. at 1708.
36. *Id*. at 1708–09.
37. *Id*. at 1713.
38. *Id*. The Navy Yard is "home to more than 11,000 employees and 143 companies, with active initiatives on sustainable building and innovative energy management." *Id*. at 1714.

39. *U.S. Department of Energy Names the Navy Yard as Location for Testing Micro-PMU Technology*, The Yard Blog (Mar. 29, 2016), https://perma.cc/M4TA-5PZH [hereinafter The Navy Yard].

40. *See* Jones, *supra* note 1, at 1713–14.

41. The Navy Yard, *supra* note 39. These institutions include PECO, an electric gas and utility company in Pennsylvania, Pennsylvania State University, GE Grid Solutions, PJM,a regional transmission organization, and DTE Energy, an electric and gas utility. *Id.*

42. *Id.*

43. *Id*. PMUs serve as sensors that monitor the quality of electric power flowing through large power transmission lines and communicate this critical data in real time to the transmission grid operator; micro-PMUs are capable of doing this on a smaller scale. *Id*.

44. *Id.*

45. Jones, *supra* note 1, at 1714; *see also* 66 Pa. Cons. Stat. Ann. § 102 (West 2004) (defining a public utility).

46. *Id.*

47. *Id.*

48. *Id*.

49. *Id*. at 1747–48.

50. Jones, *supra* note 1, at 1747 (citing 16 Conn. Gen. Stat. § 16-243y(b) (2012) ("[t]he Department of Energy and Environmental Protection shall establish a microgrid grant and loan pilot program to support local distributed energy generation for critical facilities.")).

51. *See* Jones, *supra* note 1, at 1747–48.

52. *Id*. at 1728. This program is now called Reforming the Energy Vision (REV). Diane Cardwell, *Solar Experiment Lets Neighbors Trade Energy Among Themselves*, N.Y. Times (Mar. 13, 2017), https://perma.cc/P7S5-Q2XD.

53. Jones, *supra* note 1, at 1727–28.

54. Cardwell, *supra* note 52.

55. *Id.*

56. *Id*.

57. *Id*.

58. Jones, *supra* note 1, at 1739 (quoting N.Y. Gen. City Law § 20(10)).

59. Pittsburgh Vision Narrative, *supra* note 14, at 6–7.

60. *See id*. at 1–2. The City of Pittsburgh has the highest rates of asthma in the state due to the close proximity to transportation infrastructure. *Id*. at 1.

61. U.S. Dep't of Transp., Smart City Challenge, https://perma.cc/L5NH-8BZP [hereinafter Smart City Challenge].

62. Pittsburgh Vision Narrative, *supra* note 14, at 2.

63. *Id.* at 2–3; *see also* Ali Mostafavi, *A System-of Systems Framework for Exploratory Analysis of Climate Change Impacts onCivil Infrastructure Resilience*, Sustainable & Resilient Infrastructure 1, 3 (2018), https://perma.cc/EEJ9-8ZF2. A "systems-of-systems approach" is the "combination of a set of different systems [that] forms a larger system of systems that performs a function not performable by a single system alone where the existence and interaction of several independent/interdependent systems and players' interactions affect resilience." *See also* Ali Mostafavi, *A System-of-Systems Approach for Integrated Resilience Assessment in Highway Transportation Infrastructure Investment*, Infrastructures 1, 2 (Dec. 2017), https://perma.cc/ST79-T92U.

64. Existing distributed energy systems in Pittsburgh that will serve as the framework to enable connectivity for microgrid development throughout the city. Project Information, Nat'l Energy Tech. Lab., https://perma.cc/HLN4-ENYJ [hereinafter NETL Pittsburgh Project Information].

65. Pittsburgh Vision Narrative, *supra* note 14, at 2–3.

66. *Id*.

67. NETL Pittsburgh Project Information, *supra* note 64.

68. *Id*. The MOU entered into on July 15, 2015 lists the scope of the activities that will modernize Pittsburgh's energy grid. It highlights the additional companies, organizations, and agencies that will be partnering with NETL to complete the work, including regional and local organizations, private companies, foundations, and academia. This includes: "the University of Pittsburgh's Center for Energy, the Urban Redevelopment Authority of Pittsburgh, the National Academies of Science, Duquesne Light, NRG Energy, the University of Pittsburgh Medical Center, Peoples Gas, Oxford Development, Hillman Foundation, RK Mellon Foundation, Heinz Endowment, and the RAND Corporation." *Id*.

69. *Id.* While most projects are currently in the concept and development phase, University of Pittsburgh's Energy GRID Institute is leading the way for the Energy Vision with research into developing infrastructure for a first of its kind DC powered delivery system using solar and wind renewables. Dr. Gregory Reed & Dr. Katrina Kelly, *Pittsburgh Steels Up for Microgrid Leadership*, Energy Times (Jan. 3, 2018), https://perma.cc/L5XK-GHGG.

70. *Id*.

71. Elisa Wood, *Will America's Steel City Build the First Grid of Microgrids?*, Microgrid Knowledge (May 16, 2017), https://perma.cc/J336-YFZ8.

72. Reed & Kelly, *supra* note 69.

73. *Id*.; Andrew Burger, Pittsburgh Steps Up City-scale Microgrid In*itiative,* Microgrid Knowledge (May 23, 2018), https://perma.cc/Z952-PZEV.

74. Reed, *supra* note 69.

75. Burger, *supra* note 73.

76. NETL Pittsburgh Project Information, *supra* note 64.

77. *Id*. NRG Energy is designing a new heat and power plant in the Uptown District. The Brunot Island power station will serve Pittsburgh's Northside commercial districts. The 2nd Avenue Energy District project, complete with garage and rooftop photovoltaic solar and battery storage for electric vehicle charging stations, serves the 2nd Avenue corridor from Homestead to Downtown Pittsburgh. The Larimer Energy District, a community-based microgrid, will be part of the redevelopment of Pittsburgh's East End neighborhood. The ALMONO Energy District, a mixed use development in Hazelwood, will operate on almost exclusively renewable-based distributed energy. The Duquesne Light Company will install a microgrid in their Woods Run operations on Pittsburgh's Northside to investigate challenges and solutions for integration of distributed energy technologies. *Id*.

78. *Id.*

79. 66 Pa. Cons. Stat. §§ 2801–15 (1996); Andrew Maykuth, *The power of choice, 20 years later*, Philly.com, https://perma.cc/W9H7-STBV.

80. 66 Pa. Cons. Stat. § 2804(3); Maykuth, *supra* note 79. Currently, about 30 states have a form of deregulated energy markets within the United States. *Map of Deregulated Energy States & Markets*, Electric Choice, https://perma.cc/7R52-L7GA.

81. 66 Pa. Cons. Stat. §§ 2804(2), 2806(a); *see* Maykuth, *supra* note 79.

82. 66 Pa. Cons. Stat. § 2804(4); *Pennsylvania Electric Restructuring*, 3954 PUC Util. Reg. News 8 (2010). As of 2011, generation, transmission, and distribution rate caps have expired resulting in potential price increases to consumers. *The Expiration of Electric Generation Rate Caps*, Pa. PUC, https://perma.cc/SHW9-V9UZ.

83. 66 Pa. Cons. Stat. § 2806(a).

84. Christina Alam, *It's not Always Sunny in Philadelphia: The Problem with the Pennsylvania Solar Initiatives*, 16 U. Pitt. J. Tech. L. & Pol'y 208, 215 (2016).

85. *Id*. at 212–13.

86. *Id*. at 216; 73 Pa. Cons. Stat. § 1648.2 (2007). Section 2 of AEPSA defines an "alternative energy credit" as a tradable instrument "used to establish, verify and monitor compliance with the act." A unit of credit equals "one megawatt hour of electricity from an alternative energy source." *Id*.

87. Alam, *supra* note 84, at 216.

88. ARRIPA v. Pa. Pub. Util. Comm'n, 966 A.2d 1204, 1207 (Pa. Commw. 2009).

89. Alam, *supra* note 84, at 217.

90. *Id*. at 226. By allowing customers to sell back their unused energy to the utilities, this can cause the utility to incur additional costs that they have to pass along to their customers. While a small group of customers reap the benefits of net-metering, the remainder of the utilities' customers are impacted with higher costs. *See id.* at 210-11.

91. *Id*. at 221.

92. *Id*. This is the process that public utilities must go through to adjust electricity prices, ensuring fair prices to consumers via a public review process and approval by the regulatory commission. *Id*.

93. *Id.*

94. *Id*.

95. Alam, *supra* note 84, at 221.

96. *Id*. at 226; *see also* Lazar, *supra* note 8, at 11. Investor owned utilities (IOUs) are utilities owned by "private companies, subject to state regulations financed by a combination of shareholder equity and bondholder debt." *Id*.

97. *See generally* Jones, *supra* note 1, at 1718–19 (discussing legal hurdles when defining a microgrid).

98. *See id*.

99. *Id*. at 1718.

100. *See id*. at 1718–19.

101. Elisa Wood, *Why Pennsylvania Utilities Want to Build Public Purpose Microgrids: Legislative Hearing*, Microgrid Knowledge (June 22, 2017), https://perma.cc/MY34-X7BG [hereinafter as Public Purpose Microgrid].

102. *Id*.

103. *See* 66 Pa. Cons. Stat. § 102 (2018). A public utility is "any person or corporation now or hereafter owning or operating in this Commonwealth equipment or facilities for . . . producing, generating, transmitting, distributing . . . electricity . . . for the public for compensation . . . [but] does not include . . . any building or facility owner/operators who hold ownership over and manage the internal distribution system serving the building or facility and who supply electric power and other related electric power service." *Id*.

104. Jones, *supra* note 1, at 1718 (quoting 73 Pa. Stat. Ann. § 1648.2). A "customer-generator" is defined as "a non-utility owner or operator or a net metered distributed generation system . . . who make[s] their systems available to operate in parallel with the electric utility during grid emergencies as defined by the regional transmission organization or where a microgrid is in place for the primary or secondary purpose of maintaining critical infrastructure . . ." *Id*.

105. Jones, *supra* note 1, at 1718.

106. *Id*. at 1754.

107. *Id.*

108. *Id*.

109. *See id*. (discussing issues with qualifying a microgrid under the public utility model).

110. *See infra* Part IV(D).

111. *See In re* PECO Energy Company for (1) Approval of Its Microgrid Integrated Technology Pilot Plan and (2) Issuance of a Declaratory Order Regarding the Recovery of Microgrid Costs at 1, No. P-2016-2546452 (May 18, 2016) (on file with Pa. Pub. Util. Comm'n) [hereinafter *In re* PECO Microgrid].

112. *Id*. at 1–2. In October 2015, PUC approved PECO's electric LTIIP to enhance its energy infrastructure and modernize [its] distribution system. PECO presented in the plan that part of the investment would be the development of microgrids. PUC required that PECO file a separate "petition for a Major Modification or an amended LTIIP in order to implement a future microgrid." PECO's petition submitted on May 18, 2016 was for that purpose. *Id*. at 4–5

113. *Id*. at 10.

114. *Id*. at 16.

115. *Id*. at 1, 16. The following costs would be recovered and paid for by PECO's customers: "(1) one-time development costs; (2) one-time engineering, procurement and construction ("EPC") costs; and (3) annual operation and maintenance ("O&M") expense." *Id*. at 16.

116. Pa. Pub. Util. Comm'n, System Improvement Charges Distribution and Collection 1, https://perma.cc/SV3K-M3AN.

117. *In re* PECO Microgrid, *supra* note 111, at 8.

118. *Id*. at 1–2.

119. Joint Petition for Leave to Withdraw Pleadings to Permit Microgrid Collaborative Process at 3–4, In re PECO Energy Company for (1) Approval of Its Microgrid Integrated Technology Pilot Plan and (2) Issuance of a Declaratory Order Regarding the Recovery of Microgrid Costs, No. P-2016-2546452 (Oct. 27, 2016) (on file with Pa. Pub. Util. Comm'n) [hereinafter PECO Withdrawal for Microgrid].

120. *Id*. at 3. Direct Energy, the Philadelphia Area Industrial Energy Users Group (PAIEUG), and the Retail Energy Supply Association (RESA) all filed petitions to intervene in response to PECO's petition. *Id*.

121. Direct Testimony of Matthew White ex rel. Retail Energy Supply Association at 3, In re PECO Energy Company for (1) Approval of Its Microgrid Integrated Technology Pilot Plan and (2) Issuance of a Declaratory Order Regarding the Recovery of Microgrid Costs, No. P-2016-2546452 (Aug. 4, 2016) (on file with Pa. Pub. Util. Comm'n) [hereinafter White Testimony].

122. *Id*. at 2–3. RESA is a diverse and broad group of retail energy suppliers that promote sustainable, efficient, and customer-oriented competitive retail energy markets. *Id*. at 2 n.1.

123. *Id*. at 7.

124. *Id*.

125. *Id*. at 6.

126. PECO Withdrawal for Microgrid, *supra* note 119, at 4.

127. *See* White Testimony, *supra* note 121, at 4.

128. Letter from Daniel W. Hurson, Assistant Gen. Counsel, BGE on BGE's Pub. Purpose Microgrid Proposal to David J. Collins, Exec. Sec'y, Maryland Pub. Util. Comm'n. (Dec. 18, 2015) [hereinafter BG&E Proposal].

129. *Id*. at 3.

130. *See generally* Baltimore Gas and Electric Co.'s Request for Approval of its Public Purpose Microgrid Proposal, Pub. Serv. Comm'n of Md. No. 9416 (July 19, 2016) [hereinafter BGE PSC Decision].

131. *See id*. at 18.

132. *Id*. at 11–16.

133. *Id*. at 18.

134. Elisa Wood, *Pennsylvania Tackles a Big One: Who Pays for Utility Microgrids?*, Microgrid Knowledge (June 2, 2017), https://perma.cc/Y6M4-2NY4 [hereinafter Wood HB1412]. H.B. 1412 was

introduced on May 9, 2017, sponsored by Representative Stephen Barrar and was referred to the Committee on Veterans Affairs and Emergency Preparedness. *Id*.

135. Wood, *Public Purpose Microgrid*, *supra* note 101. PECO Energy and Duqusne Light representatives were among a few of the industry companies that testified and shared support before the House of Veterans Affair and Emergency Preparedness Committee. *Id*.
136. *Id*.
137. Wood HB1412, *supra* note 134.
138. Wood, *Public Purpose Microgrid*, *supra* note 101.
139. *Id*.
140. Wood HB1412, *supra* note 134.
141. *Id*.
142. Wood, *Public Purpose Microgrid*, *supra* note 101.
143. *See* H.B. 1412, Gen. Assemb., 2017 Sess. (Pa. 2017) [hereinafter Pa. H.B. 1412] (proposing amendment to Title 66 of the Pennsylvania Consolidated Statutes adding section 2816).
144. *Id*. § 2816(c).
145. *Id*. § 2816(b).
146. Wood, *Public Purpose Microgrid, supra* note 101.
147. *See supra* Part IV(B).
148. *Id.*
149. *Id*.
150. Pa. H.B. 1412, *supra* note 143.
151. *Id*.; § 2816(e).
152. *See* Wood HB1412, *supra* note 134.
153. *Id.*
154. White Testimony, *supra* note 121, at 6.
155. *See id*. at 7.
156. *Id*. at 8.
157. Pa. H.B. 1412, *supra* note 143.
158. White Testimony, *supra* note 121, at 8.
159. *See* Pittsburgh Vision Narrative, *supra* note 14, at 3.
160. *See* White Testimony, *supra* note 121, at 7.
161. *See* Christina Simeone & John Hanger, *Case Study of Electric Competition Results in Pennsylvania,* Kleinman Center of Energy Policy 3 (Oct. 28, 2016), https://perma.cc/K5WB-WMU3 (comparing Pennsylvania's retail average state wide electricity prices at 15% higher than the national average, prior to restructuring of its electricity generation market, to prices dropping 0.1% lower than the national average in 2015, after deregulation of the state's electricity generation took place).
162. Anabel Genevitz, *Basic Utility Needs Simply Unaffordable For Some Families: From the Legal Intelligencer*, Regional Housing Legal Service (Apr. 12, 2017), https://perma.cc/N9ZH-39P6.
163. 66 Pa. Cons. Stat. § 2804(9) (1996).
164. Genevitz, *supra* note 163.
165. Coal. for Affordable Util. Serv. & Energy Efficiency in Pa. v. Pa. Pub. Util. Comm'n, 120 A.3d 1087, 1090 (Pa. Commw. Ct. 2015).
166. *Id*.
167. Genevitz, *supra* note 162.
168. *Id*. Research shows that when CAP customers switched to a competitive supplier instead of the default EDC, they were paying more. "For all five of the electric utilities in the state that currently allow CAP customers to switch to a competitive supplier, the data shows that it has cost, on average, approximately $7 million more per year than it would have had all CAP customers remained on a default service." *Id*.
169. *Coal. For Affordable Util. Serv*., 120 A.3d. at 1090.
170. *Id.* at 1092.
171. *Id.* at 1091.
172. *Id.* at 1092.
173. Genevitz, *supra* note 163.
174. *See* 66 Pa. Cons. Stat § 2804(9) (1996).
175. *See* Pittsburgh Vision Narrative, *supra* note 14, at 2.
176. Jones, *supra* note 1, at 1747; *see supra* Part III(C).
177. *See* Smart City Challenge, *supra* note 61.
178. *See* Cardwell, *supra* note 52.
179. *See* Asmus, *supra* note 22, at 20.
180. Wood, *Public Purpose Microgrid*, *supra* note 101.
181. Jones, *supra* note 1, at 1743–44.

Lead Laws and Environmental Justice in New York

By Katrina Smith Korfmacher, Emily A. Benfer, and Matthew J. Chachère

Introduction

Federal law began to phase out the use of lead in gasoline in the early 1970s and banned the use of lead in paint in the late 1970s. Since that time, population-wide levels of lead poisoning have declined dramatically. Nonetheless, lead poisoning remains a key environmental health risk, particularly for children living in older housing in disrepair. Widespread publicity about the lead contamination of Flint, Michigan's water supply in 2014 raised public awareness that lead remains in our environment. Today, lead sources that include pre-1978 paint, lead-contaminated dust and soil, leaded pipes and solder, and imported consumer goods continue to threaten the health and well-being of the population, especially children.

According to the Centers for Disease Control and Prevention (CDC), New York has more children identified with elevated blood lead levels (EBLL) than any other state. Up to 108,000 young children in the state may have a blood lead level (BLL) of 5 micrograms per deciliter (µg/dL) or higher.[1] New York has the nation's greatest number of housing units (over 4 million units), the highest percentage of pre-1960 (55.08%) and pre-1950 (41.0%) housing, and the oldest housing inventory among the 50 states (see Table 1). This older housing stock places residents at greater risk of exposure to lead hazards. Lead is widely recognized as an issue of environmental justice because low-income children living in older housing have the highest risk of lead poisoning.

	State	Percentage of Housing Stock Built 1978 or Before	Percentage of Housing Stock Built 1959 or Before	Percentage of Housing Stock Built Before 1950
1	New York	77.8%	55.1%	41.0%
2	Rhode Island	72.5%	47.2%	38.3%
3	Massachusetts	70.5%	49.2%	39.5%
4	Connecticut	70.2%	42.9%	29.5%
5	Pennsylvania	68.9%	46.5%	34.4%

Table 1

Table 1: Age of Housing Stock in the United States (Top 5 States)[2]

Research has shown that even low levels of lead can cause lifelong health, behavior, and learning problems that contribute to staggering social costs, including over $6.4 billion for the 2019 birth cohort of children in New York.[3] The CDC has repeatedly lowered the blood lead "level of concern" as understanding of the health impacts of lower levels of lead has emerged. In recognition of the current scientific consensus that no level of lead poisoning is safe, the CDC set a "reference value" for lead poisoning of 5 µg/dL in 2012 that will be updated every four years to reflect the 97.5th percentile of the population BLL in children ages 1–5.[4]

In 2019, New York adopted the CDC reference value when it enacted legislation that lowered the statewide definition of "elevated lead levels" from 10 µg/dL to 5 µg/dL.[5] The state joins seven other states that require environmental investigations, nurse case management, and other interventions at this lower threshold (see Table 2).[6]

States that ***require*** lead hazard inspections	States that ***require nurse case management and lead hazard inspections***
California (2018)	Illinois (2019)
Maine (2015; excludes owner-occupied single-family residences)	Maryland (2019)
New Hampshire (adopted 2018, effective 2021)	New Jersey (2017)
New York (2019)	
North Carolina (2017)	

Table 2

Table 2: State Action When a Child's BLL Is Equal to or Above 5 µg/dL[7]

The lower threshold means that many more children will now be considered to have an EBLL (see Figure 1) and will receive interventions earlier in the timeline of exposure, with concomitant costs for the expanded public health response.

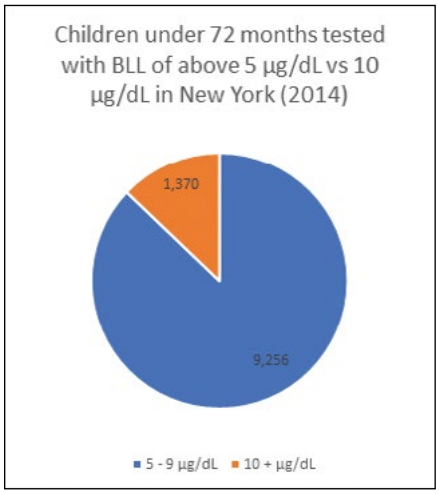

Figure 1

Figure 1: Blood Lead Levels in New York Children[8]

Nonetheless, under New York's current regulatory regime, except in some localities such as New York City or Rochester, a child must still be lead poisoned and potentially suffer permanent brain damage before any

interventions occur that could identify the source of lead exposure. Despite release of a 2018 federal lead action plan, national efforts to actively promote primary prevention of lead exposure appear to have stalled. State and local programs are therefore key to preventing lead poisoning and its deleterious consequences. Addressing lead's contribution to the health disparities faced by children living in environmental justice communities is a particular concern. In this article, we present a brief overview of lead poisoning in New York, current policy approaches in the state, and future opportunities for effective prevention.

Why Are We (Still) Talking About Lead?

Lead was first recognized as toxic during the Roman Empire. In 1786, Benjamin Franklin warned about the dangerous consequences of a lack of action in response to lead hazards.[9] In the 20th century, the medical community identified the particular risks of lead-based paint to children. Health professionals' concerns were effectively undermined by the lead industries (paint, gasoline, etc.) in a tobacco industry-like saga spanning decades.[10] As a result, lead permeated the urban environment through the continued use of lead in paint, fixtures, water pipes, and gasoline. Despite the federal policies phasing out lead from paint and gasoline in the 1970s, the legacy of lead continues to pose a threat to children through contaminated house dust, old paint, soil, and water. The main sources of lead exposure vary from one place to another, but lead-based paint hazards are the most significant sources of exposure for most children.[11]

According to the CDC, the American Academy of Pediatrics, and longstanding environmental health research, there is no safe level of lead in the body. Lead exposure has multiple negative and permanent effects on children's health.[12] The primary concern is lead's effects on the developing brain—it can reduce IQ, cause learning problems, and lead to impulsive behaviors.[13] In addition, lead exposure in childhood can contribute to lifelong health effects including hypertension, osteoporosis,[14] and cardiovascular disease,[15] among other morbidities.[16] Research suggests that lead may interact with other environmental exposures, including stress, potentially exacerbating its impacts on children living in low-income neighborhoods.[17] Because lead affects how the brain and body develop, its damage cannot be readily reversed. Lead poisoning is therefore often referred to as a disease that can be prevented, but not cured.

The growing evidence documenting the lifelong effects of low-level lead exposure and the concentration of exposures in environmental justice communities has sustained the public health field's concerns about lead, despite dramatic reductions in population-wide blood lead levels. Public awareness of lead hazards in urban environments was rekindled by the Flint drinking water crisis.[18] Subsequent media coverage, including Reuters reports in 2017 on surprisingly high rates of lead poisoning across the country, heightened public interest.[19] Recent reports on the prevalence of lead hazards in both private[20] and public[21] rental housing in New York City have

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increased recognition that lead remains a housing hazard in older buildings in the state.

These mounting concerns spurred renewed efforts to update federal lead policies, regulations, and programs. The Green & Healthy Housing Initiative released a "Strategic Plan to End Childhood Lead Poisoning: A Blueprint for Action" in 2016, laying out recommendations for federal agencies and legislation, as well as priorities for state and local governments and philanthropy.[22] In February 2017, the National Center for Healthy Housing and the National Safe and Healthy Housing Coalition endorsed 50 specific recommendations for federal action as part of their "Find It, Fix It, Fund It" Lead Elimination Action Drive campaign.[23] Later that year, the Health Impact Project completed a comprehensive analysis of potential policies to reduce childhood lead poisoning, concluding that eliminating all lead exposure for children born in 2018 could avoid up to $84 billion in future costs.[24] The 10 "key policies" recommended by this report included enforcing the use of lead-safe work practices during renovations, reducing lead in water, and removing lead hazards from low-income housing. Taken together, these documents provide a sound basis for policy changes needed at the federal level. However, the Federal Action Plan to Reduce Childhood Lead Exposure released in December 2018 did not set explicit goals to implement these recommendations.[25] This dearth of proactive policy change at the national level has increased lead advocates' focus on what states and localities can do to address lead poisoning.

A Snapshot of Lead in New York

Due to the limitations of federal lead poisoning prevention laws, states are left to develop lead poisoning prevention policy, creating wide variances in approach. New York has long been a leader in lead policy. In 1970, New York enacted Article 13, Title X of the Public Health Law banning the sale of lead paint nearly a decade in advance of federal law.[26] In addition, Title X gave the health commissioner (or delegated local health department) authority—albeit not the mandate[27]—to require owners to repair "conditions conducive to lead poisoning," most commonly in the homes of children identified with EBLLs. The reach of this "secondary prevention" approach was expanded dramatically by amendments to Title X in 1992 that required "universal screening" including blood lead testing of all 1- and 2-year-old children.[28] Associated New York State Department of Health (DOH) regulations require health care providers to educate families of children with elevated blood lead levels, and to conduct an "environmental investigation" for children with higher EBLLs.[29] At the time, this was one of the most ambitious state lead poisoning programs in the country.

Ultimately, however, the elimination of lead poisoning requires "primary prevention"—identifying and addressing hazards before children are exposed and become lead poisoned. Nationwide, 19 cities and states, including Rochester and New York City, require some form of pre-rental lead hazard inspection prior to occupancy (see Table 3).[30] New York State lead poisoning prevention advocates have long promoted strengthening the State's primary prevention efforts. A comprehensive bill was introduced in 2007 that would have established a statewide primary prevention system, among other provisions.[31] A less comprehensive bill passed both houses in 2008,[32] but was vetoed by then-Governor Paterson, citing fiscal concerns.[33]

Private Market Pre-Rental Lead Hazard Inspection Requirements*

Dust Wipe & Visual Assessment	Risk Assessment	Visual Assessment Only	Lead Paint Inspection
Cleveland, OH†	Cleveland, OH	Burlington, VT	Massachusetts
Lancaster, PA	Detroit, MI	Grand Rapids, MI	Newark, NJ
Maryland	Washington, D.C.	New York, NY	New Jersey§
Philadelphia, PA		San Diego, CA	Paterson, NJ
Rhode Island		Vermont‡	
Rochester, NY			
Toledo, OH			

* This table is current as of November 2019.
† Cleveland requires the owner obtain either a dust wipe plus visual assessment or a risk assessment.
‡ Vermont requires compliance with "essential maintenance practices" that removes deteriorated visible lead-based paint prior to rental of the property. Burlington adopted local legislation requiring compliance with the essential maintenance practices and additional requirements in rental units.
§ New Jersey requires the commissioner to conduct lead paint inspections every five years. Newark and Paterson adopted local legislation requiring a lead paint inspection and additional requirements in rental units.

Table 3

In 2007, DOH piloted a "primary prevention" program that provided $3 million to local health departments in eight counties with high rates of lead poisoning.[34] Local programs were given discretion in designing programs to provide education and inspections of homes where children had not yet been poisoned. Based on the accomplishments of the pilots, this program was expanded to 15 counties where over 80% of the children identified with elevated blood lead levels lived.

In June 2009, Governor Paterson established an interagency Task Force on the Prevention of Childhood Lead Poisoning, which released a draft report on lead poisoning in New York State.[35] The Task Force recommended integrating lead into weatherization, human services, child care inspections, and housing grant programs, enhancing education and training, and adding lead into the State's Property Maintenance Code. Overall, the Task Force emphasized that DOH, alone, did not have the resources to prevent lead poisoning, and that many other State agencies needed to do more to prevent lead poisoning. Few of the Task Force recommendations have been fully implemented.

After the Flint water crisis, many lead-related bills were introduced in the New York State Senate and Assembly. Several passed, including a law requiring testing and reporting of lead in school drinking water (enacted in 2016),[36] and the Child Safe Products Act, which pro-

hibits the sale of goods intended for children that include toxic chemicals, including lead (passed by both houses in 2019).[37]

Notably absent from this wave of new policies, however, was a comprehensive effort to address the primary risk: lead hazards in pre-1978 housing.[38] The fact that New York State's EBLL rates remain so high suggests that a renewed effort to address lead risks in housing is urgently needed. The critical question is how to equitably and effectively *prevent* lead poisoning and reduce the societal, community, and individual costs that fall disproportionately on low-income children and children of color.

Reframing Lead as an Issue of Environmental Justice

An accurate characterization of the drivers of lead poisoning is a prerequisite to developing appropriate solutions, garnering political support for these solutions, and implementing them effectively. Framing lead as an issue of environmental justice is a key part of understanding and addressing this problem.

Although lead poisoning rates continue to decline throughout New York, statewide data clearly show lead poisoning to be an issue of environmental justice. In 2005, DOH reported that 54% of the children identified with BLLs over 10 µg/dL lived in just 68 of the over 1600 zip codes in the state.[39] Most of these "high risk zip codes" encompassed communities of color in older urban areas. For example, analysis of census data in Rochester showed that Black and Latino children were far more likely than White children to live in one of its five "high risk zip codes." The distribution of lead poisoning along racial and socioeconomic lines strongly affirms that lead is an issue of environmental justice in New York.

Lead has a disproportionate impact on lower-income children and children of color for many reasons. Children with low socioeconomic status:

1) Are the most likely to live in high lead-risk housing: pre-1978 housing in poor condition.
2) Have caregivers who are the least likely to have access to the knowledge needed to protect their children (e.g., the sources of lead exposure, its importance, and ways to avoid hazards).
3) Reside in low-income households that, even when aware of the danger, may lack the capacity to reduce lead hazards (e.g., renters cannot fix deteriorated windows and may face retaliatory eviction for complaints, low-income owners may not be able to afford remediation, parents with multiple jobs may not have time for frequent lead-safe cleaning).
4) May live in neighborhoods with significant non-housing sources of lead, including current or past industrial sources, soil contaminated by lead in gasoline, airport emissions, etc.
5) Are less likely to have resources to secure early educational intervention and other interventions that may mitigate long-term effects of lead poisoning.
6) May be exposed to stressful environments and other exposures that interact with lead to cause greater harm.

Recent immigrants and refugees face particular risk. Not only are they vulnerable for the reasons listed above, but also they may have been exposed to lead in their home countries, use traditional products containing lead, fear that raising concerns with landlords or government actors will put their families at legal risk, or be unable to understand public health messages about lead prevention that are in English.

This characterization of lead as a problem of environmental justice has several implications for developing solutions. First, it may guide targeting of policies to reach those at greatest risk first. Second, it is essential that solutions be feasible to implement in low-income housing, particularly private rentals. Third, raising awareness of the inequitable impacts on children who already face many barriers to success may increase motivation for action. At the same time, highlighting that lead poisoning can happen anywhere—and that the financial costs of lead poisoning (special education, medical costs, juvenile justice, etc.) are borne by the entire society—may be important for mustering the political support needed to devote resources to this problem.

Promoting Primary Prevention at the State Level

The framework for primary prevention policy is embodied in the phrase: "find the hazards, fix the hazards, fund the fix."[40] Implementing this mandate requires multiple strategies by many actors and institutions. A wide range of approaches is needed to identify and address lead in paint, dust, water, consumer products, soil, and other sources. Because of the dominance of housing-based hazards in New York, we focus here on several strategies that address pre-1978 housing.

Find the Hazards

Lead hazards are invisible. Harmful levels of lead in house dust or soil may exist absent peeling paint or other visible signs of deterioration. Detailed inspections are needed to find lead hazards, ranging from visual inspections (with the assumption that deteriorated paint and bare soil contain lead), to dust wipe tests (which capture a "point in time" assessment of lead dust hazards), to risk assessments (that collect paint, dust, dirt, and water samples), to lead paint inspections using an XRF (X-ray fluorescence) gun. These inspection protocols have varied levels of accuracy, cost, and technical expertise requirements.

"Finding hazards" also means identifying high-risk housing and neighborhoods for inspection or intervention. Pre-1978 rental housing is generally the riskiest housing, and research suggests that public housing tends to be less risky than privately owned housing, both because of the associated federal lead regulations and also perhaps due to a lower prevalence of lead-based paint for various historical reasons.[41] Some states, such as New Jersey and Massachusetts, target pre-1978 housing where a pregnant woman or child under 6 lives.[42] As noted above, several states have implemented proactive lead-hazard rental inspections, requiring periodic lead inspection by the owner, private technician, or public agency staff before a tenant occupies the unit (see Table 3).[43] Existing inspection requirements apply primarily to rental housing.[44] For owner-occupied housing, one potential strategy is to require inspection at the time of sale.

"The main goal of funding lead hazard control under a comprehensive prevention system is to promote equity by incentivizing rapid, effective repair of the highest-risk housing while avoiding disruption of housing markets and the availability of low-income housing."

Regardless of the method chosen to identify and inspect target housing, it is important to share this information publicly so that the private market can encourage proactive repair and maintenance to address hazards. Federal disclosure laws require sharing information about known lead hazards with future renters or buyers, although limited enforcement of this law has encouraged several localities to enact policies to enhance disclosure.[45] In addition to sharing lead hazard information with individuals, decision-makers need aggregate information over space and time. For example, geographic analysis of the distribution of children with elevated blood lead levels provides a way to check on where the system has failed to proactively find lead hazards and prevent lead poisoning.

Fix the Hazards (Safely)

Once lead hazards are identified, the second step is to ensure that they are effectively repaired. This requires establishing standards for remediation, ensuring that the work is done safely, and engaging in strong enforcement. The U.S. Department of Housing and Urban Development (HUD) and the U.S. Environmental Protection Agency (EPA) have established clear standards for abatement (full removal or permanent encapsulation of all lead components) and interim controls (removal of lead from friction surfaces and stabilization elsewhere). Although full abatement is more expensive, it does not require repeated inspection as the use of interim controls or other methods does.

It is critical that lead hazards be controlled or abated in a safe manner to avoid generating severe new lead hazards by dispersing lead dust when disturbing paint around a home. In 2010, EPA implemented the Renovation, Remodeling and Painting (RRP) Rule, which sets forth lead-safe work practices, training curricula, and worker certification standards for renovation work in pre-1978 housing. Even landlords doing work in units they own are required to be trained and certified, but given the EPA's limited resources, enforcement of this law can be challenging.

Enforcing standards for remediation and work practices requires timely monitoring of activities in the field, often inside privately owned homes. This requires field staff capacity, a strong quality assurance program, and education to ensure that clients, owners, and residents are equipped to report hazards. Dust wipe inspections after work is completed are the only reliable way to detect unsafe work practices, and periodic inspections can detect if hazard controls have failed over time. Because EPA has limited capacity to enforce the RRP Rule due to distance and resources, many states (albeit not New York) have adopted the RRP Rule and engage in localized enforcement and oversight.[46] In addition, states that have adopted the RRP Rule can set standards for stricter clearance testing and improve training requirements and work practices.

Funding the Fix

Permanently removing lead hazards can be extremely expensive, sometimes exceeding the total value of the house. Interim controls are less costly, but can still be significant expenses, particularly when window replacement is necessary. Many owner-occupants and landlords lack the capital to make the needed investments. Therefore, any comprehensive state lead prevention system must consider how to pay for this work.

In New York, several municipalities have received millions of dollars in Lead Hazard Control grants from HUD. However, these grants can only assist a limited number of properties each year. States can augment these programs, which generally provide grants to owner-occupants and loans to investor-owners (landlords). In addition, lead safety can be integrated into other kinds of housing assistance programs such as energy efficiency programs. Several states have implemented new fees to support lead hazard remediation in private housing, although in most places these funds have supported the state's implementation and enforcement efforts. California, for example, levies an annual fee on manufacturers

and entities involved with the production or sale of lead and lead-based products including paint and petroleum.[47] In Maine, a fee is placed on the price of paint at retailers throughout the state, ranging from $0.35 to $1.60.[48] Massachusetts imposes surcharges of $25 to $100 on the annual fees of certain professional licenses, including for real estate brokers, property and casualty insurance agents, mortgage brokers and lenders, small loan agencies, and individuals who perform lead inspections.[49] Los Angeles recently enacted a housing ordinance that imposes a $43.32 annual fee on owners of rental properties with two or more units to cover the cost of the City's systematic code inspection program.[50] In 2018, Connecticut enacted a law imposing a $12 surcharge on homeowners' insurance to fund their Healthy Homes program.[51] This approach significantly increases funding for lead poisoning prevention in a state.

The main goal of funding lead hazard control under a comprehensive prevention system is to promote equity by incentivizing rapid, effective repair of the highest-risk housing while avoiding disruption of housing markets and the availability of low-income housing. Any comprehensive statewide lead prevention system should include resources to track unintended impacts on housing so that programs can be adapted and affordable housing expanded, as necessary.

There are many other approaches and combinations of strategies to finding, fixing, and funding primary prevention of lead poisoning. Fortunately, other states offer an expanding range of models and experiences from which New York can learn. A comprehensive statewide primary prevention system that provides for effective approaches to finding hazards, fixing them, and funding remediation is needed to address New York's persistent lead problem.[52] However, the variations in the nature of lead risks within the state suggest that local efforts are also needed to address the unique challenges of New York's diverse communities.

The Potential for Local Action

In addition to improving the statewide framework for lead poisoning prevention, action at the local level is essential.[53] The diversity of housing stock, tenure, and resources in the state make primary prevention even more complex. There are vast differences in housing characteristics between New York City and the rest of the state, and between urban areas, older rural villages, and newer housing in suburban areas. These economic, demographic, and housing stock differences among New York's many communities require different approaches.

For example, collaboration among health care providers, legal advocates, and communities resulted in the adoption of New York City's housing-based lead poisoning prevention law (Local Law 1 of 1982), one of the first in the country. The original law[54] required permanent abatement of all lead-based paint in child-occupied dwellings buildings with three or more rental units. While New York City's current lead law, Local Law 1 of 2004,[55] no longer requires full abatement, it does require the permanent abatement of lead-based paint on friction surfaces (and the remediation of all deteriorated lead-based paint) prior to rental of any residential property, and requires owner inspections at least annually in child-occupied dwelling units in buildings with three or more units.[56] Given the prevalence of large apartment buildings in New York City, Local Law 1's focus on multi-unit dwellings was a logical way to prioritize resources, but it may not be appropriate for upstate cities with significant numbers of single-family private rental homes. For example, when Rochester added lead to its existing proactive rental inspection program in 2006, it included all pre-1978 rental units.[57] After several years of data showed much higher rates of hazards in one- and two-unit homes, the law was amended to exempt dwellings with more than five units from dust wipe testing.[58] Rural areas with high numbers of low-income owner-occupants require still different approaches. For that reason, it is important to preserve flexibility in how localities promote lead-safe housing.

In addition to proactive inspection of rental housing, local governments can contribute through:

- *Funding*: Local governments may know of specific funding needs or approaches suited to their community.
- *Enforcement*: Local laws can "mirror" state or federal laws, such as the federal disclosure law or the RRP Rule. Adding local enforcement capacity is particularly valuable to lead prevention efforts that require "eyes in the field" to detect non-compliance in a timely fashion.
- *Community coalitions*: Successful lead poisoning prevention requires strong partnerships between diverse local and state agencies, community-based groups and populations most affected by lead poisoning. Local government support of and participation in coalitions can enhance the effectiveness of program design and evaluation.
- *Education*: Because lead hazard control requires changes in the behavior of local code officials, social services programs, landlords, parents, and many others, education about the dangers of lead, relevant laws, and resources to address lead hazards is key to well-functioning systems.

State funding, technical resources, and policies can either enable or discourage such local innovations. For example, in 2018, a bill was introduced to affirmatively allow Buffalo to pass a local lead law.[59] Simply affirming localities' right to innovate might encourage other municipalities to do so. Alternatively, the State could adopt an "opt-in" program for local lead policies, such as those in

place for neighbor notification of pesticide application.[60] At a minimum, it is essential to preserve municipalities' ability to pass local lead ordinances that are appropriate to local conditions, rather than preempting local authority.[61]

Lack of local building inspection and code enforcement capacity is a significant barrier in many areas that will require state support to overcome. An initial step is to help local governments, community groups, and businesses to understand the nature of lead poisoning in their unique neighborhoods. For example, Rochester's successful lead initiative was initiated in part by a "Needs Assessment" commissioned by the local health department in 2002. State programs to inform and support local initiatives hold promise for addressing lead problems efficiently, equitably, and effectively.

Looking to the Future

Lead remains a critical environmental hazard in New York State, particularly for low-income children of color living in older housing. Now that New York has officially recognized the CDC's recommendation to take public health action for children with blood lead levels of 5 µg/dL or above, the state has the opportunity to once again become a leader in lead poisoning prevention policy. Lowering the definition of "elevated blood lead level" to 5 µg/dL is likely to (1) raise public awareness as the number of children under active management rises drastically; (2) increase concerns about the cost of management—both by public health agencies and home owners (including owner-occupants and investor-owners); and (3) protect children from additional exposure to the neurotoxin.

A comprehensive approach is needed to address all sources of children's lead exposure before a child is exposed and develops permanent brain damage, to target the most high-risk situations, and to prevent lead poisoning effectively, while continuing to bolster the DOH's secondary prevention efforts to help children who have already been exposed. As this brief overview shows, community, private, and public actors in New York can support action at the local, state, and national levels to address these challenges. These efforts could be initiated by:

1) Systematically analyzing recent national efforts to advance lead poisoning prevention to identify approaches that can be initiated at the state level—or that federal elected officials should be encouraged to pursue.

2) Evaluating the growing body of experience in other states with innovative primary prevention efforts with respect to geographic, housing, demographic, and economic conditions in New York to identify locally appropriate strategies.

3) Forming an interagency group charged with implementing steps State agencies other than DOH can take to more effectively prevent lead exposures.

4) Exploring ways to promote local prevention policies that are appropriate to local resources and conditions, including but not limited to proactive inspection of rental housing (e.g., opt-in policies, financial support, or technical resources).

5) Supporting local and statewide multi-stakeholder collaborations to inform and evaluate these efforts to ensure that they meet the needs of New York's diverse communities, help those at highest risk, and are implemented effectively.

The federal policies that were so effective at reducing national rates of childhood lead poisoning since the 1970s were informed by policy innovations initiated in New York. Despite progress, New York's most vulnerable children remain at risk. Addressing lead as an issue of environmental justice requires a comprehensive approach, multi-sectoral involvement, and community-government partnerships at all levels of policy action.

Endnotes

1. In 2011, the most recent year for complete CDC data, 12,009 of the 334,930 tested children younger than 72 months in New York City had BLL above 5 µg/dL (3.58%). In New York State (excluding New York City), 13,786 of the 222,805 tested children younger than 72 months had BLL above 5 µg/dL (6.61%). *Number of Children Tested and Confirmed BLL's ≥10 µg/dL by State, Year, and BLL Group, Children < 72 Months Old*, CDC , https://www.cdc.gov/nceh/lead/data/Website_StateConfirmedByYear_1997_2014_01112016.htm (last visited July 9, 2019). However, not all children are tested for lead, or tested to the extent required by State law. Assuming that these rates of EBLL apply to all children under 72 months in New York City (639,380) and New York State (1,386,618), respectively, yields an estimate of 108,721 EBLL children statewide (not including children over 72 months of age). This estimate provides an upper bound for the number of children with BLL over 5 µg/dL, since testing rates are typically higher among higher-risk children. In addition, available data shows that EBLL rates have continued to decline since 2011.
2. This table is based on data from the U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates: Physical Housing Characteristics for Occupied Housing Units (Excludes the District of Columbia).
3. According to Altarum's VALUE of Lead Prevention Calculator, New York's estimated burden is $6.4 billion based on 28,820 children born in 2019 having BLL of 2 µg/dL or greater. *See New York*, VALUE of Lead Prevention, http://valueofleadprevention.org/calculations.php?state=New%20York (last visited July 9, 2019).
4. CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention" (June 7, 2012), https://www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf.
5. *See* N.Y. Pub. Health Law § 1370(5) (enacted in 2019 N.Y. Laws 57, Part P).
6. Currently, California, Maine (excluding owner-occupied properties), New Hampshire (effective 2021), and North Carolina require lead hazard inspections, and Illinois, Maryland, and New Jersey require lead hazard inspections and nurse case management when a child's blood lead level reaches 5 µg/dL. Emily A. Benfer et

al., *Health Justice Strategies to Eradicate Lead Poisoning: An Urgent Call to Action to Safeguard Future Generations*, 19 Yale J. Health Pol'y L. & Ethics __ (forthcoming 2019) [hereinafter Benfer et al., *Urgent Call*]; *see also* Columbia Law School Health Justice Advocacy Clinic, Eliminating Lead Poisoning in New York: A National Survey of Strategies to Protect Children (2019) (on file with authors). Many additional states match the CDC reference value in their definition of elevated blood lead level but do not require specific intervention at that level.

7. Benfer et al., *Urgent Call*, *supra* note 6; *see also* Columbia Law School Health Justice Advocacy Clinic, *supra* note 6.

8. This figure combines separate data for New York City and New York State outside New York City. New York State data was only available for children under age 3; this figure was doubled to approximate incidence among children under age 6. Note that since fewer children ages 3–6 are identified with EBLL, this provides an upper estimate. For New York State: *Lead Data & Statistics: Child Blood Lead Testing and Blood Lead Levels by Zip Code*, N.Y. State Dept. of Health, https://www.health.ny.gov/statistics/environmental/lead/ (accessed July 3, 2019) (Childhood_Blood_Lead_Testing_and_Elevated_Incidence_by_Zip_Code, Beginning_2003). For New York City: *Children Under 6 Yrs with Elevated Blood Lead Levels (BLL)*, NYC Open Data, https://data.cityofnewyork.us/Health/Children-Under-6-yrs-with-Elevated-Blood-Lead-Leve/tnry-kwh5 (accessed Apr. 15, 2019).

9. Letter from Benjamin Franklin to Benjamin Vaughan (July 31, 1786), text available at https://perma.cc/QUX4-D4PN.

10. *See* David Rosner & Gerald Markowitz, Lead Wars: The Politics of Science and the Fate of America's Children (2013); Christian Warren, Brush with Death: A Social History of Lead Poisoning (2000); Jamie Lincoln Kitman, *The Secret History of Lead*, Nation (Mar. 2, 2000), https://www.thenation.com/article/secret-history-lead/.

11. Council on Envtl. Health, *Prevention of Childhood Lead Toxicity*, Pediatrics (July 2016), https://pediatrics.aappublications.org/content/pediatrics/138/1/e20161493.full.pdf.

12. Adults may also suffer from lead poisoning, although symptoms tend to be less severe than for children with similar blood lead levels and are often reversible. Elevated blood lead levels in adults may be residual from early life exposure or from current (often occupational) exposures. We focus here on childhood lead exposure because of its prevalence and significant lifelong health effects.

13. David C. Bellinger, *Childhood Lead Exposure and Adult Outcomes*, 317 JAMA 1219 (Mar. 28, 2017); Council on Envtl. Health, *supra* note 11; Anne Evens et al., *The Impact of Low-Level Lead Toxicity on School Performance Among Children in the Chicago Public Schools: A Population-Based Retrospective Cohort Study*, Envtl. Health (Apr. 7, 2015); Bruce P. Lanphear et al., *Low-Level Environmental Lead Exposure and Children's Intellectual Function: An International Pooled Analysis*, 113 Envtl. Health Persp. 895 (July 2005).

14. James R. Campbell et al., *The Association Between Environmental Lead Exposure and Bone Density in Children,* 112 Envtl. Health Persp. 1200 (Aug. 2004).

15. Bruce P. Lanphear et al., *Low-Level Exposure and Mortality in US Adults: A Population-Based Cohort Study*, Lancet Pub. Health (Mar. 2018).

16. Kent Bennett et al., *Lead Poisoning: What's New About an Old Problem?*, Contemp. Pediatrics (Apr. 2015).

17. Deborah A. Cory-Slechta et al., *Lifetime Consequences of Combined Maternal Lead and Stress*, 102 Basic & Clin. pharm. & toxic. 218 (2008); Margaret T. Hicken et al., *How Cumulative Risks Warrant a Shift in Our Approach to Racial Health Disparities: The Case of Lead, Stress, and Hypertension*, 30 Health Aff. 1895 (2011); Devon C. Payne-Sturges et al., *Engaging Communities in Research on Cumulative Risk and Social Stress-Environment Interactions: Lessons Learned from EPA's STAR Program*, 8 Envtl. Just. 203 (2015).

18. Indeed, the last time a lead article in this publication focused on lead policy was 1993, the year New York's then cutting edge secondary prevention program was implemented. Suzette Brooks, *Lead-Based Paint: Liability Looms for Landlords*, 4 Envtl. L. N.Y. 138 (Sept. 1993).

19. M.B. Pell et al., *Lead's Hidden Toll: Hundreds More Lead Hotspots Are Identified as Trump Prepares to Gut Programs*, Reuters (Apr. 21, 2017), https://www.reuters.com/investigates/special-report/usa-lead-states/.

20. Joshua Schneyer & M.B. Pell, *Lead Poisoning Lurks In Scores of New York Neighborhoods*, Reuters (Nov. 14, 2017), https://www.reuters.com/investigates/special-report/usa-lead-newyork/.

21. Emily A. Benfer, Op-Ed., *New York's Public Housing Is the Size of a City. It's Failing Children.*, Wash. Post. (Feb. 11, 2019) [hereinafter Benfer Op-Ed], https://www.washingtonpost.com/opinions/new-yorks-public-housing-system-is-the-size-of-a-city-its-failing-children/2019/02/11/458f63c2-2bb7-11e9-984d-9b8fba003e81_story.html.

22. Green & Healthy Homes Initiative, Blueprint for Action: Strategic Plan to End Childhood Lead Poisoning (Oct. 2016), https://www.greenandhealthyhomes.org/wp-content/uploads/strategic-plan-1.pdf.

23. Nat'l Ctr. for Healthy Housing & Nat'l Safe & Healthy Housing Coal., Find It, Fix It, Fund It: A Lead Elimination Action Drive—Policy Recommendations to Congress and the New Administration (2017), https://nchh.org/resource-library/FFF-Action-Drive-Transition-Document_Admin-Version.pdf.

24. The majority of these benefits come from avoiding damage to children's brains and associated reductions in their lifelong earning potential, as well as in expenditures for medical care, special education, premature mortality, and incarceration. *See* Health Impact Project et al., 10 Policies to Prevent and Respond to Childhood Lead Exposure: An Assessment of the Risks Communities Face and Key Federal, State, and Local Solutions (Aug. 2017), https://www.pewtrusts.org/-/media/assets/2017/08/hip_childhood_lead_poisoning_report.pdf.

25. Emily A. Benfer. et al., *Duty to Protect: Enhancing the Federal Framework to Prevent Childhood Lead Poisoning and Exposure to Environmental Harm*, 18 Yale J. Health Pol'y L. & Ethics __ (2019), *available at* https://ssrn.com/abstract=3408133; *see also Federal Action Plan to Reduce Childhood Lead Exposure*, U.S. Envtl. Prot. Agency, https://www.epa.gov/lead/federal-action-plan-reduce-childhood-lead-exposure (last updated Apr. 2, 2019).

26. *See* 1970 N.Y. Laws 338, § 4 (codified as amended at N.Y. Pub. Health Law § 1372); *see also* Matthew J. Chachère, N. Manhattan Improvement Corp. Legal Servs., Lead Paint Laws and Regulations in New York City 44 (May 10, 2018), https://www.nmic.org/nyccelp/documents/lead-training-manual.pdf.

27. *See Cmty. Action Against Lead Poisoning v. Lyons*, 43 A.D.2d 201 (3d Dept. 1974), *aff'd*, 36 N.Y.2d 686 (1975) (holding that health commissioner's action is entirely discretionary).

28. 1992 N.Y. Laws 485 (codified as amended at N.Y. Pub. Health Law §§ 1370-a(2), 1370-c, 1370-d, 1370-e); *see also* Chachère, *supra* note 26, at 45.

29. Implementing regulations are at 10 N.Y.C.R.R. Part 67. Until 2019, an environmental investigation of a child's home was not required below a EBLL of 15 µg/dL, although several counties voluntarily inspected at lower levels. Regulations proposed by DOH on May 1, 2019 to implement lowering the definition of EBLL included environmental investigation at 5 µg/dL. *See* N.Y. Reg. vol. XLI, issue 18, at 15 (May 1, 2019).

30. Benfer et al., *Urgent Call*, *supra* note 6.

31. 2007 Bill Text NY A.B. 7533A (Peoples); 2007 Bill Text NY S.B. 4121A (Perkins).

32. Childhood Lead Poisoning Primary Prevention and Safe Housing Act, 2008 Bill Text NY A.B. 6399 (Gantt); 2008 Bill Text NY S.B. 6350 (Robach).

33. Veto Memo No. 176 (Oct. 15, 2008).

34. Nat'l Ctr. for Healthy Housing, New York State's Primary Prevention of Childhood Lead Poisoning Pilot Program: Year One Implementation Final Report (Feb. 27, 2009), https://nchh.org/resource-library/nysdoh-clpppp_year-01-implementation-report_2007-2008.pdf. The five counties within New York City were treated as a single county. *See* N.Y. State Task Force on the Prevention of Childhood Lead Poisoning, Preliminary Report 13 (2009), https://www.health.ny.gov/environmental/lead/exposure/childhood/task_force/docs/2009_preliminary_report.pdf.

35. N.Y. State Task Force on the Prevention of Childhood Lead Poisoning, *supra* note 34. The interagency Task Force's final report was never publicly released.

36. 2016 N.Y. Laws 296 (codified at N.Y. Pub Health Law § 1110 and N.Y. Educ. Law §§ 1950, 3602).

37. 2019 N.Y. Bill Text A.B. 6296 (Englebright); 2019 N.Y. Bill Text S.B. 501 (Kaminsky); *see also* Denis Slattery, *NY Dems Barring Toxic Toys as They Pass Sweeping Set of Bills Meant to Protect the Environment and Public Health*, N.Y. Daily News (Apr. 30, 2019), https://www.nydailynews.com/news/politics/ny-dems-environment-kaminsky-toxic-toys-lead-cadmium-mercury-20190430-core6tnpf5bulitzocavp6c7ea-story.html; Press Release, Clean & Healthy N.Y., New York State Policymakers Pass Bipartisan Bill to Protect Children from Toxic Chemicals (Apr. 30, 2019), https://www.cleanhealthyny.org/child-safe-products-act-passes.

38. The 2019 Executive Budget included a provision requiring inspection of all pre-1978 rental units in the state, but this was not included in the State's adopted budget. *See* FY 2019 New York State Executive Budget: Health and Mental Hygiene Article VII Legislation, Part R, at 115 (2019), https://www.budget.ny.gov/pubs/archive/fy19/exec/fy19artVIIs/HMH-ArticleVII.pdf.

39. The report indicated that outside of New York City, just 22 zip codes accounted for nearly 40% of all EBLL cases. DOH, Eliminating Childhood Lead Poisoning in New York State: 2004-2005 Surveillance Report, at 68 tbl.3 (not dated), https://www.health.ny.gov/environmental/lead/exposure/childhood/surveillance_report/2004-2005/docs/full_report.pdf.

40. The Rochester Coalition to Prevention Lead Poisoning used this framework to explain its comprehensive approach to lead in the early 2000s; it was later taken up as the tagline for the 2016 national campaign to update lead policy and programs.

41. Katherine A. Ahrens et al., Housing Assistance and Blood Lead Levels: Children in the United States, 2005–2012, 106 Am. J. Pub. Health 2049 (2016); David E. Jacobs et al., The Prevalence of Lead-Based Paint Hazards in U.S. Housing, 110 Envtl. Health Persp. A599 (Oct. 2002); see also *New York City v. Lead Indus. Ass'n*, N.Y.L.J. Aug. 10, 1995, at 23, col. 1 (S. Ct. N.Y. Co.) (New York City public housing "never purchased lead paint"). Despite these findings, there has been recent evidence of persistent lead hazards in multiple cities' public housing. See, e.g., Benfer Op-Ed, supra note 21; Molly Parker, HUD Is Failing to Protect Children from Lead Paint Poisoning, Audits Find, ProPublica (June 22, 2018, 5 AM EDT), https://www.propublica.org/ARTICLE/HUD-IS-FAILING-TO-PROTECT-CHILDREN-FROM-LEAD-PAINT-POISONING-AUDITS-FIND; Benjamin Weiser & J. David Goodman, New York City Housing Authority, Accused of Endangering Residents, Agrees to Oversight, N.Y. Times (June 11, 2018), https://www.nytimes.com/2018/06/11/nyregion/new-york-city-housing-authority-lead-paint.html.

42. New Jersey requires pre-rental inspection for pregnant women or children under 6 in a pre-1978 unit (N.J. Admin. Code § 5:10-6.6(c)); *see also The Massachusetts Lead Law*, Mass.gov, http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/lead/lead/ (last visited July 10, 2019). *See generally* Mary Jean Brown, *Costs and Benefits of Enforcing Housing Policies to Prevent Childhood Lead Poisoning*, 22 Med. Decision Making 482 (2002); Ruanda McFerren et al., Robert M. La Follette School of Public Affairs, Univ. of Wisc.-Madison, Improving Local Lead Hazard Disclosure: A Case Study Analysis (Spring 2018), https://www.lafollette.wisc.edu/images/publications/workshops/2018-Lead-Disclosure-FINAL2.pdf.

43. Benfer et al., Urgent Call, supra note 6.

44. ChangeLab Solutions, A Guide to Proactive Rental Inspection Programs (2014), http://www.changelabsolutions.org/sites/default/files/Proactive-Rental-Inspection-Programs_Guide_FINAL_20140204.pdf.

45. *See* McFerren et al., *supra* note 42.

46. *See* Columbia Law School Health Justice Advocacy Clinic, *supra* note 6.

47. *See* Health Impact Project et al., *supra* note 24.

48. *Maine*, PaintCare, https://www.paintcare.org/paintcare-states/maine/#/everyone (last visited July 10, 2019).

49. Health Impact Project et al., *supra* note 24.

50. L.A Admin. Code § 161.352.

51. 2018 Conn. Legis. Serv. P.A. 18-160 (H.B. 5209); 2018 Conn. Legis. Serv. P.A. 18-52 (S.B. 357).

52. *See, e.g.*, Childhood Lead Poisoning Prevention and Safe Housing Act of 2019, 2019 Bill Text NY A.B. 3432 (Bichotte); 2019 Bill Text NY S.B. 5107 (Parker) (introduced but did not advance in 2019 session).

53. Katrina Smith Korfmacher, Policy Brief, Local Housing Policy Approaches to Preventing Childhood Lead Poisoning (Sept. 2014), http://phlr.org/product/local-housing-policy-approaches-preventing-childhood-lead-poisoning; Katrina S. Korfmacher & Michael L. Hanley, *Are Local Laws the Key to Ending Childhood Lead Poisoning?*, 38 J. Health Pol. Pol'y & L. 757 (Aug. 2013).

54. Previously codified at N.Y.C. Admin. Code § 27-2013(h).

55. Codified at N.Y.C. Admin. Code Title 27, Article 14, and in various sections of Title 17.

56. This local lead law was amended or replaced several times, with the most comprehensive revision being Local Law 1 of 2004, codified in the New York City Administrative Code, beginning at Section 27-2056.1. *See also* Chachère, *supra* note 26, at 55. In 2019, a batch of ten laws (Local Laws 64 through 73 of 2019) made a number of additional changes, among them a tightening of the definitions of lead paint to 0.5 mg/cm^2, lead dust to 10 $\mu g/ft^2$ on floors (5 $\mu g/ft^2$ after June 1, 2021), 40 $\mu g/ft^2$ on window sills, and 100 µg/ft2 on window wells, as well as enhanced data reporting by City agencies.

    In part in response to widespread reports of inadequacies in the City's enforcement of the lead laws (*see, e.g.*, Nolan Hicks, *NYC Has Never Sued Under Law Requiring Landlords to Test for Lead Paint: Report*, N.Y. Post (Sept. 25, 2018, 2:42 PM), https://nypost.com/2018/09/25/nyc-has-never-sued-a-landlord-who-failed-to-inspect-for-lead-paint-report/), the Mayor announced a new program, "LeadFreeNYC," on January 28, 2019. *See* Press Release, Office of the Mayor, Mayor de Blasio Announces LeadFreeNYC, a Comprehensive Plan to End Childhood Lead Exposure (Jan. 28, 2019), https://www1.nyc.gov/office-of-the-mayor/news/061-19/mayor-de-blasio-leadfreenyc--comprehensive-plan-end-childhood-lead-exposure#/0; LeadFreeNYC, www1.nyc.gov/content/leadfree/pages/ (last visited July 10, 2019). However, advocates continued to have concerns about effective enforcement. *See, e.g.*, Sarina Trangle, *What Has Mayor's Lead Enforcement Accomplished? Absolutely Nothing' Advocate Says*, am New York (May 8, 2019, 7:13 PM), www.amny.com/real-estate/nyc-apartment-lead-1.30825435.

57. Katrina Smith Korfmacher, *Collaborating for Primary Prevention: Rochester's New Lead Law*, 14 J. Pub. Health Mgmt. & Prac. 400 (July-Aug. 2008); Katrina Smith Korfmacher et al., *Rochester's Lead Law: Evaluation of a Local Environmental Health Policy Innovation*, 120 Envtl. Health Persp. 309 (Feb. 2012).

58. Katrina Smith Korfmacher, *Boundary Networks and Rochester's "Smart" Lead Law: The Use of Multidisciplinary Information in a Collaborative Policy Process*, 20 New Solutions 317 (Nov. 2010); *see also Lead Paint—Essential Links and Documents*, https://www.cityofrochester.gov/lead/ (last visited July 10, 2019).

59. 2018 N.Y. Bill Text A.B. 9784 (Ryan); *see also* 2019 N.Y. Bill Text A.B. 6094 (Ryan).

60. *See Neighbor Notification*, N.Y. State Dept. of Envtl. Conserv., https://www.dec.ny.gov/chemical/8529.html (last visited July 10, 2019).

61. Several states have recently limited municipalities' ability to regulate housing and land use, reflecting the larger national trend toward preempting local policy initiatives. ChangeLab Solutions et al., Preemption and Public Health Advocacy: A Frequent Concern with Far-Reaching Consequences, (Sept. 2013), http://www.changelabsolutions.org/sites/default/files/Preemption_PublicHealthAdvocacy_FS_FINAL_20130911.pdf.

Facts on the Ground; Climate Assessment Report; Court Cases; FEMA Response to Climate Change; Washington, D.C.

By Carl Howard

Facts on the Ground

2018 will be the earth's fourth warmest on record, with the five warmest years all having occurred since 2010. A warmer world is a more dangerous world for all living things. Warmer temperature leads to increased evaporation and more moisture in the atmosphere which produces more and heavier rains and flooding. People drowned in the Carolinas and in the Indian state of Kerala. Heat waves killed people in Montreal, Karachi, and Tokyo.

California's Camp Fire was the deadliest and most destructive wildfire in state history. At least 86 people were killed, 153,336 acres burned, 18,804 structures were destroyed. Damage was estimated to be $7.5–$10 billion. All of which pales in comparison to the human, and non-human, suffering and terror.

Other wildfires in California included the Woolsey Fire that burned in Los Angeles and Ventura counties. It burned 96,949 acres and destroyed 1,643 structures, killed three people, and forced the evacuation of over 295,000 people. Pushed by strong winds the fires at times spread at a rate of an acre per second catching and incinerating people in their cars as they tried to escape or in their homes as they hoped to ride out the disaster. Those who survived describe the experience as sheer terror. In speaking with friends in the area, the challenge now is accepting that this is their new normal and deciding whether they are willing to live in an area this dangerous (not to mention the likely decreased value of their property).

Federal Government's National Climate Assessment

Toward the end of November 2018, 13 federal agencies issued a report on current and future global warming effects across the U.S. The report cited numerous essential adaptation measures (costing many billions of dollars) to harden coastlines, rebuild sewer systems and overhaul farming practices to protect against the kinds of floods, wildfires and heat waves that have already begun.

Citing the state of unreadiness for this challenge, the report states that the Midwest has only four counties and cities that have written climate change plans. Scientists are forecasting bigger crop failures and heavier floods that could cripple transportation networks in this region. And at the federal level, Trump is rolling back policies to take future sea-level rise into account when building new roads and railways.

The report details five major steps the country must take by mid-century:

1. Rethink how we farm.

The nation's food supply is in jeopardy as global warming intensifies. Crop yields for corn, wheat and soy decline as the number of extremely hot days increases. More frequent droughts could reduce supplies of irrigation water. Dairy cows produce less milk in the sweltering heat.

In areas at risk for drought, farmers will need to use more precise irrigation techniques to conserve water. In the Great Plains, dairy farmers and ranchers may need to relocate production or invest in climate-controlled buildings to protect their cattle from heat stress. The report emphasized that "these approaches have limits under severe climate change impacts."

One hope is that seed companies might develop new crop varieties that are better able to tolerate drought, heat waves and pests. However, the report notes that "progress in this area has been modest."

2. Build for the future, not based on the past.

Much of the nation's infrastructure, like roads and sewers, was built based on a more stable climate. But climate change has brought a new normal which includes extreme weather as a new normal so the past is no longer a good guide to the future.

Nearly half the residents of Hampton Roads, Va., were unable to drive out of their neighborhoods at some point last year due to high tide flooding due to sea level rise. In the Northeast, sewer systems built for the storms of the past are expected to overflow more frequently as climate change produces heavier rainfall.

3. Retreat from the coasts.

Depending on future GHG emissions, global sea levels are likely to rise between 1 and 4 feet (or more)

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this century putting trillions of dollars worth of coastal homes, infrastructure and businesses in the US at risk of flooding.

While large cities like New York and Boston will likely invest heavily in sea walls, tide gates and pumping stations (like London and Japan), they won't be able to protect everyone. In Norfolk, Va., officials are looking into relocating vulnerable neighborhoods.

The report states that millions of people nationwide may have to move away from the coasts. Yet policymakers are unable to broach such an unpopular topic. Many local governments, in search of more tax revenue, still promote development along coastlines. And numerous federal policies (see FEMA, below), such as subsidized flood insurance and rebuilding communities in place after disasters, encourage people to stay in at-risk areas.

Katherine Greig, a senior fellow at the Wharton Risk Center and co-author of the report's chapter on adaptation, said that "We're still a long ways" from having "a serious conversation about retreat."

4. Enlist nature to help.

The report details ways that our natural environment can be a cost-effective defense against climate change. Planting more trees in cities can help reduce urban temperatures and protect people from deadly heat waves. Restoring degraded wetlands and marshes can protect cities and coasts from flooding and improve water quality. Healthy forests that are allowed to burn at a low level periodically, as they did in the distant past, are less prone to extreme wildfires. Protecting pollinators could help make our agricultural system more resilient.

The report points to several Midwestern cities, including Milwaukee, which have begun to restore streams to their natural state, removing concrete linings so that they can safely carry away more water during heavy storms.

5. Expect the unexpected.

The 1,656-page Assessment warns that global warming will bring unpredictable dangers, particularly as complex systems like energy, water, transportation and public health all come under severe stress at once. The "cascading failures" experienced during Hurricane Harvey in Texas last year served as an example. Flooding shut gasoline refineries, strained hospitals, clogged roadways and spread toxins and pathogens. These sorts of impacts are difficult to study and predict.

At a broad level, the report warns that officials at every level of government and in every corner of the economy will have to include climate change in their decisions, to plan for a wide range of possible futures, and to continually re-evaluate those plans. "Adaptation entails a continuing risk management process," the report notes. "It does not have an end point."

With this in mind, my co-chairs, Mike Gerrard, Kevin Healy and Ginny Robbins organized a day-long conference on climate change for non-environmental lawyers. CC impacts many areas of law, including real estate, contracts, labor, and any business relationship with a supply chain that may be disrupted due to infrastructure damage or impassible seas or other impediments. Lawyers are well advised to consider such potential impacts in their legal relationships.

Despite the fact that the vast majority of the global community recognizes the imminent danger posed by climate change, global GHG emissions rose faster in 2018 than in 2017, 2.7% vs 1.6%.

The Intergovernmental Panel on Climate Change, issued a report in October 2018 warning that if emissions continue to rise at the current rate the planet will warm 2.7F (1.5C) above preindustrial levels by 2040, which likely will cause widespread food shortages, wildfires, coastal flooding and environmental refugees.

Led by China (27%), the US (15%) the European Union (10%) and India (7%), humanity will release a record 37.1 gigatons of planet-warming emissions in 2018 (roughly 100,000 times the weight of the Empire State Building).

Even as coal has fallen out of favor in some markets, the rise in emissions has been driven primarily by stronger demand for natural gas and oil. Renewable energy generation has expanded exponentially but demand for energy, often met by fossil fuels, more than off-sets such gains. Cheap gasoline prices, bigger cars and people driving more miles boost oil use. The fact that extreme weather disasters cost the US a record $306 billion is not equated with climate change by policy makers or voters.

The new IPCC study was issued as delegates from nearly 200 countries gathered in Poland to decide on the "rule book" to implement their next steps under the Paris climate agreement. But increasing global emissions are making the goals of the Paris accord, to limit warming to well below 2C, virtually impossible.

Meeting in Poland

With the need for swift, decisive action to combat continued global warming more dire than ever, the U.S. delegation advocated increased use of fossil fuels. The result of the conference was some baby steps in the right direction in terms of how countries will track and report their GHG emissions. Siding with the U.S. were other major fossil-fuel producers, Russia, Saudi Arabia and Australia.

The majority of delegates wanted to formally endorse the IPCC Report, but the U.S., along with Saudi Arabia, Kuwait and Russia, refused to allow a collective statement that would "welcome" the IPCC report, agreeing only to "note" it. The Report states that fossil-fuel emis-

sions must fall roughly in half within 12 years to avoid severe climate disruptions. There is no reason to believe this is achievable.

Trump's international energy and climate adviser, Wells Griffith, stated that "The United States has an abundance of natural resources and is not going to keep them in the ground. We strongly believe that no country should have to sacrifice their economic prosperity or energy security in pursuit of environmental sustainability."

A deal was reached which requires all participating countries to follow a uniform set of standards for measuring their GHG emissions and tracking their climate policies. It requires countries to hasten their plans to cut emissions before the next round of talks in 2020 and directs richer countries to clarify how they intend to aid poorer nations install clean energy or build resilience against natural disasters. Despite Trump's vow to abandon the Paris Agreement (in 2020), the U.S. agreed to this deal. But Trump has reneged on Obama's pledge to provide two billion dollars in aid to poor countries and this thorny issue was punted until the next round of talks.

"It's hard to draw a direct cause and effect, but we know that investors do pay close attention to political signals," said Joseph Curtin, a senior fellow at the institute and the author of its report. "The Paris Agreement sent a strong signal that carbon-intensive investments were risky. Now we're seeing signals the other way."

The U.S.' alignment with Kuwait, Russia and particularly Saudi Arabia is another troubling dynamic. Saudi Arabia has long been an obstruction in the climate talks. For the U.S. to stand with Saudi Arabia in rejecting science is a shocking reversal of the former U.S. leadership role.

Court Cases: Supreme Court Lets Youths' Case Demanding Climate Action Proceed

The Supreme Court refused to halt the trial in a lawsuit brought by 21 young people seeking to force the federal government to address climate change. The court's unsigned order said the Trump administration had raised substantial questions about the plaintiffs' legal theories and the sweeping relief they sought. But the court said it would not intercede, instructing the plaintiffs to take the case back to an appeals court.

"A deal was reached which requires all participating countries to follow a uniform set of standards for measuring their GHG emissions and tracking their climate policies."

Similarly, no agreement could be reached on rules regarding carbon trading markets so it too was tabled.

Thus, limping forward with a few rules in the book, it is once again up to individual countries to pledge before the 2020 talks concrete emissions reductions. Very few countries (Chile, Vietnam and Norway) expressed eagerness to start that process.

"Of course it's important to have these rules, but a lot of the real action is happening by entrepreneurs; it's happening by business people; it's happening by the finance sector; by the money flowing; it's happening at the city and state level," said Catherine McKenna, Canada's environment minister. "Climate change is a complicated problem," she said, "and it's not going to be solved by national governments alone." But it is imperative that governments hasten and encourage movements in the market that reduce GHG emissions and aid sustainable energy. Change is occurring, but as made clear by the IPCC and National Assessments reports, it must happen faster.

Another recent report, this one by the Institute of International and European Affairs found that last year, American banks invested more heavily in coal and oil from tar sands while renewable energy investments have sagged globally, a reversal of the trends seen shortly after the Paris agreement was signed in 2015.

Justices Clarence Thomas and Neil M. Gorsuch said they would have granted the administration's request to block the trial until the Supreme Court had an opportunity to consider the case.

In July the Supreme Court was skeptical about the legal theory in the case in which the plaintiffs, led by Julia Olson, assert their constitutional right to a "climate system capable of sustaining human life." In a brief unsigned order in July, the Supreme Court said the breadth of that theory was striking. But the Court let the case move forward, saying its intervention would be premature.

Judge Blocks Disputed Keystone XL Pipeline

As the Trump administration has moved aggressively to roll back environmental protections and speed up oil and coal projects it has repeatedly been blocked by courts finding that the administration did not follow longstanding rules in making its sweeping changes.

Judge Brian Morris (District Court, Mt.), issued a repudiation of one of President Trump's first acts as president, his decision to allow the disputed Keystone XL oil pipeline to proceed, saying that the administration failed to present a "reasoned explanation" for the move and "simply discarded" the effect the project would have on climate change.

The judge's finding quickly drew fire from Trump, "It was a political decision made by a judge," said Mr. Trump. "I think it's a disgrace."

The ruling blocked construction on the 1,179-mile pipeline which would carry 800,000 barrels a day of petroleum from the Canadian oil sands to the Gulf Coast and has, over the past decade, become a lightning rod in broader political battles over energy, the environment and climate change. While experts have long said that the substantive impact of the pipeline on jobs, climate change and the nation's energy economy is small, it has nonetheless taken on an outsize prominence in the national discussion.

Judge Morris' decision echoes a common theme in many judicial rejections of Trump policies, particularly on environmental issues. In short, the court said, the administration failed to follow established rules and procedures for decisions like these. Specifically, it failed to provide a fact-based analysis justifying its actions.

The ruling specifically takes the Trump administration to task for failing to address the Obama administration's arguments about climate change, including the need to keep rising global temperatures at safe levels as a basis for denying the pipeline permit. Rather, the government declared it was embracing a policy shift toward "energy security, economic development and infrastructure."

The judge said an administration had the right to reverse a previous policy, but still must back up its reason for doing so with facts. "The Department instead simply discarded prior factual findings related to climate change to support its course reversal," the judge wrote.

He cited a U.S. Supreme Court ruling that noted, "An agency cannot simply disregard contrary or inconvenient factual determinations that it made in the past, any more than it can ignore inconvenient facts when it writes on a blank slate."

Responding to Climate Change—FEMA

Climate change has caused billions of dollars in damage to homes, infrastructure and businesses. The Federal Emergency Management Agency has distributed billions of dollars in aid. But as the following examples demonstrate, it is a program in dire need of reform as it primarily requires re-building but not adaptation to climate change.

Hurricane Katrina demolished the Plaquemines Parish Detention Center (La) but FEMA rebuilt it in the same location atop 19-foot concrete pillars at a cost of $105 million. This was a boondoggle as on average in early 2018 more than 40% of its 872 beds were unoccupied making it one of the emptiest jails in the state. Due to its flood-prone location in a marsh it still must be evacuated before major storms.

The reason this jail was rebuilt in such an inappropriate locale, with excess capacity at immense cost, was because sheriff Irvin F. Hingle Jr. demanded it and FEMA lacked the authority to overrule him. Unlike most new jail construction his project did not require bond sales or other local revenues or any accountability from voters. Because the old jail was destroyed by a natural disaster the cost was covered by federal taxpayers through a FEMA program that is legally required to distribute billions in aid but lacks authority to control how the money is spent or where the rebuilding occurs.

FEMA has provided at least $81 billion in this manner to state, territorial and local governments in response to declared disasters since 1992. One of every five public assistance dollars has gone to the flood-prone state of Louisiana, by far the most per capita of any state. Last year, estimated to be the costliest ever with $306.2 billion in damage, saw repeated major storms: Harvey (Tx), Irma (Fl), Maria (PR), Nate (Ms) and Florence (NC/SC).

While it is understandable that local officials would be authorized to decide how to spend federal dollars to rebuild their communities, experience has shown that rebuilding just causes a repeat of these problems and that the authority to spend federal dollars needs to include persons removed from the devastated community.

In Princeville, N.C., a town of 2,000 on the Tar River, the 1999 Hurricane Floyd caused flooding ruining the town hall, Princeville Elementary School, the police and fire station, the senior center and almost every other structure.

Leaders of the town rejected suggestions from state officials to move the entire community to higher ground. Bowing to local pressure and authority, FEMA spent over $5 million in public assistance grants to repair and replace the damaged properties. Not surprisingly, Princeville was flooded again in 2016 by Hurricane Matthew and the same structures were again repaired at a cost of over $2.5 million (the town typically pays a 25% share).

Clearly, more forward-thinking planning is necessary. But Trump is not so inclined. Last August, Trump rescinded an executive order signed by President Obama that required consideration of climate science in the design of federally funded projects. Then in March, FEMA released a four-year strategic plan that deleted mention of climate change and sea-level rise.

Trump ignores warnings from government agencies about the budgetary threat due to climate change. The bipartisan Congressional Budget Office projected in 2016 that costs from hurricane damage would "increase significantly in the coming decades because of the effects of climate change and coastal development." As a result, government spending for relief and recovery may outpace economic growth and consume an increasing share of gross domestic product.

FEMA's public assistance program paid for 683,035 separate projects between 1992 and mid-September 2018 removing debris after natural disasters and repairing and reconstructing public buildings, roads, bridges and utilities. During that time more money was spent on public assistance than on reimbursements by FEMA's National Flood Insurance Program which covers losses by homeowners and businesses and encourages people to live, and rebuild, in flood-plains.

Grants have gone to every state and territory with New York and Louisiana the biggest recipients because of Hurricane Sandy in 2012 and Hurricanes Katrina and Rita in 2005. About a fourth of the money has been used to repair or replace, but not to relocate, public buildings.

When structures in designated flood plains are rebuilt or repaired, FEMA requires that they be elevated to at least the 100-year flood level—meaning high enough to withstand a storm with a 1% chance of occurring in a year. Buildings that serve a critical function, like a hospital or a power plant, must be raised higher, to the 500-year level.

FEMA can only pay to relocate destroyed buildings if it is deemed cost-effective, which rarely happens. In NYC, FEMA spent over $700 million, and the city payed $80 million, to repair 72 schools damaged by Sandy. But the high cost of real estate and construction in New York City dictated that only one would be moved, to an adjacent site where it will be elevated, according to the Mayor's Office of Recovery and Resiliency.

Instead, the money was spent anticipating future flooding, raising vents, relocating electrical systems and generators to rooftops and replacing drywall with building materials that could be easily dried and disinfected.

Since Sandy, Congress has twice amended the Safford Act which authorizes federal disaster aid, attempting to make public assistance available to relocate and rebuild more responsibly. Trump signed a bill to provide more FEMA funding for projects designed to diminish future storm damage in vulnerable communities. But neither measure fundamentally alters the balance of power between federal and local officials concerning those decisions.

It is not possible to determine how much has been spent to rebuild the same structures more than once due to a lack of transparency in publicly available data. But the Natural Resources Defense Council, an environmental advocacy group, found that the separate flood insurance program paid $5.5 billion from 1978 to 2015 to repair and rebuild more than 30,000 properties that had flooded more than once. Claims for those residences and businesses had been submitted an average of five times.

The NRDC report estimated that the number of "severe repetitive loss properties" could increase to 820,000 based on predicted sea levels ris of three feet by the end of the century. It urged the government to restructure the program with incentives to encourage owners to accept buyouts and relocate.

Do we want the government, through FEMA, to continue to spend billions of dollars bailing out residents, businesses, and government agencies flooded in storms if they are rebuilding at the same sites? Should insurance companies continue to take advantage of the government when they insure flood-prone areas and can't cover the claims? This cycle of destroy and reconstruct benefits the insurance and construction industries while sticking federal taxpayers with endless, increasing, bills. Such questions are not being addressed on the federal level.

Developments in Washington, D.C.

Christopher S. Zarba, a former staff director of the Scientific Advisory Board at EPA wrote an article in the Fall about the Agency disbanding a scientific panel of experts on microscopic airborne pollutants that helped the agency determine what level of pollutants are safe to breathe. EPA also dropped plans for a similar panel of experts to help assess another dangerous pollutant, ground-level ozone.

The disbanded panel on particulate pollution reported to EPA's seven-member Clean Air Scientific Advisory Committee which is responsible for advising the Agency on overall air quality standards. Now, without the work of that panel it is entirely likely that the advisory committee will be unable to provide authoritative guidance on the regulation of this pollutant and ground-level ozone.

EPA studies show that particulate pollution can lead to premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeats, aggravated asthma and decreased lung function. Ground-level ozone can affect the breathing of people with asthma, children, older adults, and people who are active outdoors.

These are only the latest efforts at EPA to undermine science. EPA has barred scientists who received EPA research grants from serving on its nearly two dozen scientific advisory committees because of some misplaced concern over conflicts. But it has had no problem appointing scientists to those panels who hold industry-supported research grants.

Trump's Response to the Administration's Scientific Report

The National Climate Assessment (discussed above) is the most comprehensive scientific study to date detailing the effects of global warming on the U.S. economy, public health, coastlines and infrastructure. It details how the warming planet will cause hundreds of billions of dollars of damage in coming decades.

Historians and veterans of public service said it was notable that policymakers didn't try to soften the report's conclusions because that indicated the strength of the

administration's belief that it could ignore the findings in favor of policies driven by political ideology. "This is a new frontier of disavowance of science, of disdain for facts," said William K. Reilly, who headed EPA under the late President Bush.

A White House statement said the report, started under the Obama administration, was "largely based on the most extreme scenario" of global warming and that the next assessment would provide an opportunity for greater balance.

Under a 1990 law the federal government is required to issue a climate assessment every four years. The latest version introduces new complexity in the political fight over regulations designed to fight climate change because until the Obama administration no such regulations existed to be fought over.

Steven J. Milloy, a member of Trump's EPA transition team who runs the website junkscience.com, which is aimed at casting doubt on the established science of human-caused climate change said "We don't care. In our view, this is made-up hysteria anyway."

Mr. Milloy echoed Trump calling the Assessment the product of the "deep state," a term that refers to the conspiratorial notion of a secret alliance of bureaucrats and others who oppose the President.

White House officials sought to avoid the political blowback that hit the George W. Bush administration when it was revealed in 2005 that a White House official and former oil lobbyist, Philip A. Cooney, altered the language of government climate science reports to weaken the link between fossil fuel pollution and the warming of the planet.

Other Climate-Related Changes

The Centers for Disease Control and Prevention moved its Climate and Health Program into a branch that studies asthma and struck the word climate from the name of the newly consolidated office.

The climate and health office was the Center's only program focused on helping state and local governments prepare for the health consequences of fiercer storms, longer droughts and other extreme weather events. It was also an important contributor to the National Climate Assessment (discussed above).

The former head of the unit, George E. Luber, has been reassigned to the agency's waterborne diseases unit. He had been issued a dismissal notice but it was retracted after lawyers for a nonprofit watchdog group, Public Employees for Environmental Responsibility, considered filing a federal whistleblower complaint. Asked about the retraction notice, the agency declined to comment.

The $10 million Climate and Health Program within the agency is funded by Congress and, under federal law, those funds cannot be diverted to other areas of research.

Facts on the Ground; Two Key Indicators of Climate Change: Polar Ice (Blog 20) and Oceanic Health (next Blog, 21); Good News; Washington, D.C.

By Carl Howard

Facts on the Ground

A record-breaking, killing cold, air mass froze large parts of the U.S. in late January/early February. But the bad news relates to why this Polar Vortex delivered Arctic temperatures over so much of the country. Scientists believe that due to climate change, numerous factors, including loss of reflective Arctic ice, increased absorption of heat by the exposed water, and altered oceanic currents, have changed the flow of the jet stream, in effect releasing the constraints which had kept Arctic air-masses in the Arctic. The truly scary news is that this might be the new normal.

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While the planet generally is getting warmer, this potentially greater threat of altered weather patterns also produces colder cold periods compared with historical averages during human evolution. But if the planet continues to warm, such severe winter low temperatures likely will become a rarity. A 2009 study found that in the U.S. there were about as many record highs as record lows in the 1950s, but by the 2000s there were twice as many record highs as record lows.

The deaths of at least 21 people have been tied to the recent extreme cold and hundreds of thousands have been stranded, threatened and/or inconvenienced by frozen water pipes, over-taxed heaters, closed airports, icy roads and inability to reach safety. Normal life shut down due to closed businesses, schools and services. Among those who perished were four men found frozen near their homes in Illinois, Wisconsin and Michigan; six people died in traffic crashes in Iowa; a pedestrian hit with a snowplow in Libertyville, Ill.; and a woman found frozen to death inside a Milwaukee apartment after her thermostat malfunctioned. A Buffalo area resident died while using a snowblower, and another died after shov-

eling. A married couple in their 20s died in Indiana in a car crash, a man in Milwaukee died after shoveling and a man died of hypothermia in Evanston, Ill. In Williamsville, N.Y., near Buffalo, a homeless man died inside a bus shelter.

Record low temperatures may have occurred in many locales including Illinois, Mount Carroll reached minus 38F, and Cedar Rapids, Iowa, minus 30F.

Two brutal storms recently passed through much of the country including N.Y. In one, the polar vortex covered the Midwest with the coldest weather in a generation prompting Wisconsin Governor Tony Evers to declare a state of emergency and to request the assistance of the National Guard.

In Milwaukee, St. Paul and Minneapolis, public schools were closed. Governor Gretchen Whitmer of Michigan sent most state workers home early. By midday, more than 1,400 flights across the country had been canceled. The Mayor of Lansing, Michigan, Andy Schor, declared a snow emergency.

The high temperature in both Chicago and Minneapolis was forecast to be minus 14F with wind chills of minus 50 in Chicago (which would be Chicago's lowest daily high temperature on record) and minus 60 in Minneapolis.

The polar vortex was also leading to emergency preparations and school cancellations in the South which is not accustomed to cold weather. In Louisiana, where one to two inches of snow was expected, the Governor's Office of Homeland Security and Emergency Preparedness activated its crisis action team. A similar forecast in Georgia prompted Governor Brian P. Kemp to close state offices in 35 counties.

Two weeks earlier, deadly storms knocked out power to about 200,000 people in parts of the Midwest contributing to the deaths of at least nine people. Central Missouri got up to 17 inches of snow. Heavier than usual snow also fell on Baltimore, Washington, D.C., Delaware, parts of New Jersey, the mountains in Virginia, and was expected to continue across southern New Jersey. Hundreds of flights were cancelled in Chicago, Washington, D.C. and elsewhere during the holiday weekend.

Power failures affected more than 45,000 customers in Missouri, 24,000 in Kansas, 33,000 in Virginia, and more than 100,000 customers in North Carolina where Governor Roy Cooper declared a state of emergency.

There are always winners and losers and the winners in the east clearly were the skiers. North of Albany resorts boasted of nearly two feet of fresh powder. This was a welcome gift as ski resorts in general have enjoyed significantly less snow over the past years and more winter rain which used to be a rarity.

What is notable about these recent storms is precisely what climate change forecasters and models have predicted. More frequent storms of unusual intensity both in terms of rate of snowfall and extreme temperatures. These storms also are notable for affecting tens of millions of people over much of the US.

The National Weather Service, part of the National Oceanic and Atmospheric Administration, was one of the agencies affected by the partial government shutdown. Some employees were furloughed, but many forecasters are considered essential and worked without pay no doubt issuing essential warnings which saved lives.

On the other side of the planet, Australia endured record-breaking heat and wildfires (Tasmania is experiencing one of its worst ever fire seasons). Power failures followed soaring air-conditioner use overloading electrical grids. The authorities slowed and canceled trams to save power. Labor leaders called for laws that would require businesses to close when temperatures reached hazardous levels such as almost 116F in Adelaide, the capital of South Australia.

No place is exempt from the extremes hitting the planet. Heat records were set from Norway to Algeria in 2018. In Australia, a drought has persisted so long that a child in kindergarten will hardly have seen rain in her lifetime. California had its most destructive wildfires ever in 2018, triggering the bankruptcy filing by the state's largest utility, Pacific Gas and Electric.

Concentrations of carbon dioxide in the atmosphere are higher than they have been in 800,000 years which corresponds to rising average global temperatures. The last four years have been the hottest on record, and the 20 warmest years have all come in the past 22 years. Ocean temperatures have broken records several straight years.

Heat-related deaths are projected to increase five-fold in the U.S. by 2080. But for less wealthy countries like the Philippines, the forecast is 12 times more deaths. Extreme heat is already devastating the health and livelihoods of tens of millions of people, especially in South Asia while reducing crop yield and water resources.

Two Key Indicators of Climate Change: Polar Ice (This Blog) and Oceanic Health (Next Blog)

Polar Ice

There is no dispute over the importance of the polar ice sheets. If they are set on an inevitable path to melting, the impacts to life on earth will be catastrophic.

Start with this: sea-ice minimums (the least coverage of sea ice during the year, post summer) have declined an average of 21,000 square miles annually over the last 39 years. All 12 of the lowest minimums have occurred in the past 12 years.

At the local level, a huge iceberg posed such a threat of calving and flooding the village of Innaaruit, NW Greenland, that police asked villagers close to the water to evacuate their homes this past summer. Immense 40-foot piles of compacted sea ice broke off the coast of Greenland and floated to sea and melted.

It's not just that the Arctic may no longer be surrounded by sea ice, thereby opening the area to ship traffic and oil exploration, although that is a danger that is happening. And it is not just that the disappearing sea ice is an existential threat to polar bears and walruses, although that is occurring too.

The greater problem is that the dangers posed by a warming Arctic are happening and it is impacting us and we are not prepared physically or politically. For example, much of the extreme weather this summer, especially drought and wildfires in the U.S. and in western Europe, are related to Arctic warming.

As long predicted, the Arctic has been heating up faster than any other place on earth for decades. One extreme follows another. In the winter of 2017, temperatures in the Arctic were 45F degrees above normal. It is increasingly clear that the warming Arctic is changing the weather dynamics for the entire planet. We are seeing five times more monthly heat records—such as "hottest July on record in California"—than we would in a stable climate. More heat means drier soils, causing more drought and wildfires. It also means more extreme rain, given that a warmer atmosphere can suck up and then release more moisture (a global increase in rainfall records is well-documented in weather station data). Recall that Stable Climate is a key foundational block supporting human civilization (see Blog #2).

As noted above, the change in global weather patterns is driven in part by the change in the jet stream. The jet stream has slowed down significantly in recent decades and now undulates more than it used to. The jet stream is driven by the temperature contrast between the tropics and the Arctic but because this temperature difference is decreasing, the jet stream is weakening and becoming less stable. The weaker summer circulation causes fewer weather changes resulting in more persistent weather.

The change has been sudden when compared to the relatively stable weather patterns that humans evolved with. Most everything we depend on also evolved within a fairly narrow, fairly consistent, weather pattern. More recent rapid changes and extreme weather is alarming scientists. Not only were such sudden changes predicted by climate models, but these models forecast additional increasingly rapid changes and more destructive events such as what we are already seeing: drought, wildfires, storms, floods, extreme temperatures and decreased agricultural productivity. In addition, the magnitude, danger and destructiveness of these events is greater and longer-lasting than what we are accustomed to and what other living flora and fauna and ecosystems can withstand. And upon which human civilization depends.

Another major concern is the thawing of permafrost, the vast realm of permanently (until now) frozen ground that lies beneath the snow and ice in the Arctic. Trapped in this frozen soil and vegetation is more than twice the carbon found in the atmosphere. As the permafrost thaws, microbes become active and start eating the buried organic matter which in turn releases CO2 and methane, a greenhouse gas that is 25 times as potent as CO2. A 2014 study estimated that thawing permafrost could release around 120 gigatons of carbon into the atmosphere by 2100, which alone would contribute at least another .3C degrees of warming.

It gets worse. The observed melting of the permafrost in northern Siberia is occurring at a much faster rate than anticipated. The ground is cratering as the soil thaws and methane is bubbling out of thermokarst lakes (melt-water lakes on the permafrost) at a rate that is double previous estimates. This is another development that is both a troubling positive feedback loop (the more warming the more methane released, the more methane released the more warming), and one that may have surpassed its tipping point and will not stop no matter what we do to curtail GHG releases.

"The observed melting of the permafrost in northern Siberia is occurring at a much faster rate than anticipated. "

Yet another real but still-unquantifiable risk involves long-frozen bacteria and viruses like anthrax and smallpox which could emerge, triggering an epidemic like a climate change-driven Andromeda Strain sequel.

Despite warnings from scientists, numerous countries are rushing to take economic advantage of the melting Arctic. Container ships will motor through new shipping routes in the ice-free Arctic emitting huge amounts of carbon while shortening travel times from Asia to Europe. In Greenland, new mining operations for rare metals likely will open as the ice retreats. Russia's Vladimir Putin plans to treat the Arctic as a new military frontier. And Trump has pushed Congress to open the Arctic National Wildlife Refuge for drilling and has proposed both rolling back vehicle emissions standards and allowing increased methane emissions and rewriting the Clean Power Plan to loosen limits on carbon pollution from power plants. All of this contributes to melting Arctic ice and thawing permafrost.

As the recent Special Report of the IPCC urged (see Blog 17), if there is an answer to these dire developments, it involves a massive global effort to commit to a carbon-free future. What it most certainly does not include is geoengineering (various artificial strategies to deflect sunlight with atmospheric emissions or deposits in the oceans). The fact of the matter is, that even after experiencing devastating, deadly storms, as predicted by climate models, and after decades of international meetings to act on these threats, we have made negligible progress (see Blog 19 on recent meeting in Poland). It is hard to imagine what, if anything, will finally convince the holdouts and deniers that without immediate and drastic action, there is little hope in preserving the world we are totally dependent on for our food, water and livelihood.

The Arctic is a warning system, a screaming alarm alerting us to the fact that the planet we live on is rapidly changing in ways we are not prepared to accept. As the Arctic heats up, it raises sea levels in Miami and N.Y. and Bangladesh and every other coastal city in the world, and it makes drought and wildfires in California and the west likely. The trickle of refugees that is fueling the rise of the protectionist right-wing parties in the U.S., Europe, Brazil and elsewhere will increase exponentially. The immense numbers of environmental refugees will cause every country that has resources to protect, to build a wall. This has begun. The rapid changes occurring in the Arctic are remaking the weather in America and northern Europe with profound implications for human health and the environment. In our rapidly changing world, no place is too distant or too far away to be immune. All humanity, all ecosystems, are affected. When ice melts in the Arctic, the west burns, Miami floods, and humanity, sitting precariously atop the pyramid of life, wobbles.

Melting Polar Ice

A recent study on Greenland's ice states that it is melting so fast that it could become a major factor in sea-level rise around the world within two decades. Even worse, the enormous ice sheet is melting at such an accelerated rate that it may have reached a "tipping point" suggesting that it might be irreversible.

New research shows that the ice loss in Greenland is speeding up as global warming increases. The authors found that ice loss in 2012, more than 400 billion tons per year, was nearly four times the rate in 2003. The rate of ice loss in Greenland is faster than it has been for 350 years.

The study supports a growing consensus that prior estimates of the effects of a warming planet have been too conservative. Another recent study of ice loss in Antarctica found that the continent is contributing more to rising sea levels than previously thought.

New analysis suggests that the oceans are warming far faster than earlier estimates. Warming oceans are currently the leading cause of sea-level rise since water expands as it warms.

Rising sea levels are one of the clearest consequences of global warming; they are caused both by thermal expansion of the oceans and by the melting of ice sheets on land. Current projections say that if the planet warms by 2C (3.6 F) over pre-industrial times (which it almost certainly will), average sea levels will rise by more than two feet, and 32 million to 80 million people will be exposed to coastal flooding.

Much of the previous research on Greenland's ice has dealt with the southeast and northeast parts of the island, where large chunks of glacial ice calve into the sea. The new study focuses on the ice-covered stretches of southwest Greenland, which has few large glaciers and was not generally considered as important a source of ice loss.

But recent findings show that the vast plains of southwestern ice will increasingly melt, with the melt-water flowing to the ocean. Within two decades, the region will become a major contributor to sea level rise.

But the more scary part is the increased talk among scientists of the possibility that a threshold, or tipping point, may have been reached. There are warm and cool cycles which produce melting and freezing, respectively. But increasingly the cool/freezing cycle is only pausing the greater, longer-lasting warm/melting cycle which suggests a threshold has been reached. If so, one degree of future warming will be much more significant than one degree of past warming.

Most estimates of a tipping point for Greenland ice loss cite 1.5 or 2C above pre-industrial levels. Global average temperatures have already increased by about 1C (1.8F) but we are projected to exceed 1.5C and may well go beyond 2C absent major reductions in GHG emissions.

Similarly, in Antarctica, the speed of ice loss is faster in some regions than scientists had previously estimated. For example, considerable losses of glacial ice in East Antarctica has been found in an area previously considered to be relatively stable. As a whole, Antarctica lost about 40 billion tons of ice per year in the 1980s, but it has been losing roughly 250 billion tons per year in the past decade.

More troubling, it may be that the rate of Antarctica's ice loss is accelerating. One study found that the rate of ice loss had tripled since 2007. Scientists estimate the Antarctic melting will contribute six inches to sea-level rise by 2100.

Good News

The International Energy Agency published its annual World Energy Outlook, a 661-page report that forecasts global energy trends to 2040. It forecasts that over the next two decades the world's energy system will undergo a huge transformation. Wind and solar power may become dominant sources of electricity. China's once-relent-

less consumption of coal may slacken. The amount of oil we use to fuel our cars could peak and decline.

But the none of this is happening fast enough to avoid the dangers of global warming. Governments must advance forceful new policy measures to reduce GHG emissions.

Globally, the electricity sector "is experiencing its most dramatic transformation since its creation more than a century ago," the report said. Over the past five years the average cost of solar power has declined 65% and the cost of onshore wind has fallen 15%. Those prices should decline further as technology improves. Solar plants likely will out-compete new coal plants almost everywhere. The agency sees renewable power supplying 40% of the world's electricity by 2040, up from 25% today. That forecast could prove conservative as the agency tends to underestimate the speed at which wind and solar power proliferate.

The report warns, however, that many countries will need to retool their grids to manage the intermittent output from wind and solar plants. That will mean re-writing rules for how electricity markets operate, relying on batteries and gas plants for grid flexibility and exploring new tools like hydrogen storage.

Regarding coal, for decades developing countries like China and India used coal as the cheapest, easiest way to power their economies and lift themselves out of poverty. As a result, CO2 emissions skyrocketed. But that's quickly changing. China, which burns half the world's coal, has been forced by its incensed citizenry to clean up its polluted air. In response, it is investing heavily in wind, solar, nuclear and natural gas. The agency now projects that China's coal consumption will plateau around 2025, with renewables overtaking coal as the country's biggest source of electricity by 2040.

And, while countries in Southeast Asia and elsewhere are still planning to build new coal plants, the agency expects such construction to slow sharply after 2020. But while the era of rapid coal growth is slowing, the agency projects that global coal consumption could stay flat for decades as the average coal plant in Asia is less than 15 years old (compared to about 41 years in the U.S.). Those plants will keep polluting for decades unless countries decide to retire them early or develop technology to capture and bury their emissions.

Transportation remains a major contributor of GHG emissions. The report projects that global oil use for cars will peak by the mid-2020s as countries increase their fuel-economy standards (which Trump has attempted to roll back) and deploy more electric vehicles. But only about one-quarter of the world's oil is used to fuel passenger cars. The rest is used to fuel freight trucks, ships, and airplanes; for heating; and to make plastics and other petrochemicals. So global oil use will remain high and may keep rising through 2040, led by developing countries.

The unsatisfactory bottom line is that even with impressive gains in renewable energy, the world is still far from solving global warming. Global CO2 emissions rose 1.6% last year and are on track to climb again this year. The report projects that emissions will keep rising slowly until 2040.

What is needed, according to the report, is for nations to enact sweeping new policies, like investing in energy efficiency, curbing methane leaks from oil and gas operations, and developing carbon capture technology for existing fossil fuel power plants and cement factories.

Governments will play a key role: The report notes that the world invests $2 trillion annually in energy infrastructure, and 70% of that is directed by state-owned companies or regulators. Our energy destiny will rely heavily on government decisions in the next two decades.

Washington, D.C.

Andrew Wheeler is Trump's nominee to lead the EPA. He testified, over the shouts of protesters, before the Senate Committee on Environment and Public Works and defended his efforts to roll back Obama-era regulations, including the replacement of a plan to reduce emissions from coal-fired power plants, known as the Clean Power Plan, with weaker rules.

When asked about climate change, Mr. Wheeler said he believed that it is occurring, and that humans have an effect. But he said: "I would not call it the greatest crisis, no sir. I would call it a huge issue that has to be addressed globally." He later said that on a scale of one to 10, his concern about climate change is at a level of "eight or nine." He argued that EPA is addressing the challenge of rising carbon emissions. He repeated the Trump administration's finding that its plan to revise the Clean Power Plan would still reduce planet-warming emissions by 34% below 2005 levels by 2030.

Wheeler's remarks were undercut by a Harvard University study finding that Trump's plan would be worse for the planet than doing nothing at all. The study found that GHG emissions would "rebound" under the new policy by delaying the retirement of coal-fired power plants. Carbon emissions could rise in 18 states by around 8.7% by 2030, compared to having no carbon policy at all, the study found. Wheeler disputed those numbers.

Regarding recent findings that CO2 emissions rose 3.4% in 2018 in the U.S., the largest increase in eight years, Wheeler argued that GHG emissions decreased by 2.7% between 2016 and 2017 as proof that the Trump administration is protecting the environment while deregulating. However, that dip occurred before Trump officially took office and was due to market forces favorable to natural gas and not coal.

Facts on the Ground; U.S. Polling and Climate Change; Oceanic Impacts; Good News; Washington

By Carl Howard

Since Blog 20, huge, deadly, record-breaking storms occurred in Nepal, Mozambique and in the U.S. major floods occurred in Iowa, Nebraska, Missouri and nearby states. In addition, 25 states are at risk of flooding this Spring.

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In southern Nepal, at least 28 were killed and over 500 injured in a rainstorm with destructive winds that struck in the night. While thunderstorms outside of the regular monsoon season are common in Nepal, this was the deadliest single storm on record. Hundreds were killed in 2017, when multiple storms led to flooding which devastated much of South Asia.

In Mozambique, Cyclone Idai caused devastating destruction followed by flooding creating an "Inland Ocean" stalling rescues. Aid agencies called it the worst natural disaster in southern Africa in two decades.

Rescue workers reported seeing people on rooftops and in trees days after the storm struck. In areas near rivers, homes were submerged, with water rising near the tops of telephone poles. The storm also struck Malawi and Zimbabwe. Approximately 1.5 million people were affected in the three nations.

These countries are among the world's poorest and have limited capacity to respond to the disaster. Officials called for outside help and warned that delays in reaching survivors could lead to an outbreak of illnesses, including cholera and malaria. The limited amount of aid that has arrived cannot effectively be distributed due to the destruction of roads and bridges and the flooding and general destruction. The early estimated death toll was over 1,000. In Chikwawa alone, the worst-affected area, more than 54,000 people have been displaced.

In the U.S., nearly two-thirds of the lower 48 states will have an elevated risk of some flooding until May, and 25 states could experience "major or moderate flooding," according to the National Oceanic and Atmospheric Administration.

The National Weather Service predicts that the flooding this year could be worse than anything we've seen in recent years, even worse than the historic floods of 1993 and 2011. The major flooding this past March is a preview of what is expected for the rest of the Spring. Thirteen million people could be exposed to major flooding, making this a "potentially unprecedented" flood season and yet possibly the new normal.

Infrastructure is proving incapable of coping with the rising floodwaters. The levees in much of the Midwest are aging and, in many cases, not designed to withstand the river levels seen in the last decade. Last year, landowners from four Midwestern states won a lawsuit against the Army Corps of Engineers that claimed the repeated floods amounted to a seizure of their property.

At least 62 levees were breached or overtopped in the Midwest in March, and hundreds of miles of levees were damaged. An estimated $80 billion in reconstruction is needed to the nation's levee system.

Senator Josh Hawley, Republican of Missouri, said that the Corps was "hamstrung" by "radical environmentalist lobbyists that are forcing the agency to prioritize wildlife over farmers."

Much of the eastern U.S., and parts of California and Nevada, home to more than 200 million people, could experience flooding this Spring. The dire prediction is based on the fact that the basins of the Upper Mississippi and the Red River of the North have had heavy rain and snow this Spring at double normal levels.

NE., IO., and SD set over 30 records in the end of March alone. Flooding devastated farmers and ranchers across the region, put communities like Hamburg, Iowa, underwater, and wiped out roads and bridges in others.

Gov. Pete Ricketts of Nebraska put a preliminary estimate of $1.4 billion in damages in his request for a federal disaster declaration, including $439 million in damages to public infrastructure and $85 million to homes and businesses.

NOAA identified the greatest risks for flooding in the upper, middle and lower Mississippi River basins, the Red River of the North, the Great Lakes, and the eastern Missouri River, lower Ohio River, lower Cumberland River and Tennessee River basins.

Chemical runoff from the rains likely will cause above-average hypoxia conditions—"dead zones" of water with low oxygen caused by nutrient pollution that can kill fish and other marine life—in the Gulf of Mexico and Chesapeake Bay.

More rainfall in the Midwest is a predictable consequence of climate change, according to the most recent National Climate Assessment, produced in 2018 by 13 federal agencies. A warmer atmosphere holds more moisture which comes down as precipitation.

Scientists are increasing sure of its ability to link record-setting climatic events to climate change via "attribution science."

The 1993 flood in the Midwest killed 50 people and caused $15 billion in damages. In the 2011 floods, the Army Corps of Engineers took the extraordinary measure of blowing up 11,000 feet of Mississippi River levee to let water flow into the Birds Point floodway in Missouri, saving the little Illinois town of Cairo but inundating more than 100,000 acres of farmland and homes. We can expect more controversial and desperate decisions such as this to be made in the future. Possibly the very near future.

Earlier in March a deadly tornado hit Alabama. It was the Region's worst in 30 Years. It flattened parts of rural Alabama and killed at least 23. Nearly 4,000 tornadoes have struck Alabama and the surrounding region since 1989. Over 50 storms in the last 30 years have rated 4 or 5 out of 5 on the scale of intensity. This year, six tornadoes in a single day struck near Beauregard, an area that rarely sees such strong storms.

U.S. Polling and Climate Change

A recent survey by researchers at Yale and George Mason University found that 69% of Americans were "worried" about global warming, an 8-point increase from the previous Spring. A possible explanation, the researchers suggested, was the run of extreme weather disasters in 2018, from wildfires to hurricanes, along with increased efforts by scientists to link such events to climate change.

Polling consistently shows that more than half of Americans now accept that climate change is caused by human activities. While most surveys show that among Republicans, less than half accept that science, the data also reveals a sharp generational divide among Republicans.

A 2018 poll found that just 18% of Republicans born in the postwar baby boom accepted the reality of human-caused climate change, but twice that number of millennial Republicans, those born from 1981 through 1996, accepted that science.

In addition, the 2018 poll found that 45% of millennial Republicans said they were seeing some effects of global climate change in the communities where they live, compared with a third of baby boomer Republicans.

Oceanic Impacts

In Blog 20 I noted that two key climate change indicators are the stability of the polar ice caps (briefly addressed in Blog 20) and the health of the oceans. A recent study has shown that ocean heat waves are posing multiple threats to marine life. Such heat waves are now happening far more frequently than they did last century and are harming the diversity of marine life. From coral reefs to kelp forests to sea grass beds, researchers found that heat waves were destroying many ocean ecosystems.

Marine heat waves occur when sea temperatures are much warmer than normal for at least five consecutive days. In August, 2018, at Scripps Pier in San Diego the sea surface temperature set an all-time record high (25.9C, 78.6F).

Scientists estimate that the oceans have absorbed over 90% of the heat trapped by excess greenhouse gases since midcentury. Humans have added these gases to the atmosphere largely by burning fossil fuels, like coal and natural gas, for energy.

An earlier study found that from 1925 to 2016, marine heat waves became, on average, 34% more frequent and 17% longer. Over all, there were 54% more days per year with marine heat waves globally.

"As ocean water heats, and as sea level rises, coastal populations, including many employed in commercial fisheries and aquaculture, are threatened both in terms of their livelihood and physical safety due to decreased productivity, storms/flooding and erosion."

The most severe years tended to be El Niño years. Warmer ocean temperatures are one of the characteristics of an El Niño pattern. But regional marine heat waves can happen even without an El Niño. And El Niños may be getting more extreme due to climate change.

As ocean heat waves proliferate, problems mount for people who depend on fishing and fish farming, or aquaculture. As ocean water heats, and as sea level rises, coastal populations, including many employed in commercial fisheries and aquaculture, are threatened both in terms of their livelihood and physical safety due to decreased productivity, storms/flooding and erosion. An estimated one billion people depend on coral reefs, which are highly sensitive to temperature, for food or income.

The study found many parts of the Pacific, Atlantic and Indian Oceans where aquatic life was especially vulnerable. These areas were home to great biological diversity and had plants and animals that were already living in the warmer parts of their ranges. They were also affected by other human impacts like pollution and overfishing.

Seabirds too are being adversely affected as heat waves impact their food sources which either died or moved in response to the warming.

The biggest surprise may have been the significant loss of "foundational species" like coral reefs, sea grasses and kelp forests. They support the diversity of aquatic life by providing shelter from predators, moderating temperatures and acting as food sources. When they disappear, the entire ecosystem disappears along with them.

These studies focused just on heat impacts. Other studies have shown multiple additional oceanic insults such as acidification from carbon absorption which is altering the marine food chain from its microscopic foundation through apex predators, as well as more direct assaults such as over-fishing and pollution. Sea levels continue to rise due to heat-induced expansion. Additional threats to humans perched atop the Life Pyramid (see Blog 1[1]), is that oceanic currents are changing which impacts fish migration, disrupts commercial fishing and alters global weather patterns.

Good News

On March 27, I attended a program on Carbon Capture and Sequestration (CCS) at Columbia's Center on Global Energy Policy. Three panelists and the moderator opined that after 15 years of developmental projects technologies are ready to be sized up to a scale that could begin the capture and sequester of significant amounts of carbon. Projects have demonstrated the feasibility of injecting captured carbon into bedrock (both on the land and at sea) where it is absorbed into porous sandstone, and an impermeable rock cover ensures that the carbon will not escape. The U.S. has trillions of tons of storage capacity, we emit billions of tons of carbon annually and are theoretically capable of beginning to capture and sequester millions of tons annually. What is needed now is infrastructure (mostly pipelines to move the condensed carbon) and funding. One of the panelists was from the Department of Energy, which has been actively working to develop this technology.

If we are to have any chance of keeping global temperature from rising more than 2C, such technology is essential. In 1994, the concentration of carbon dioxide in the atmosphere was 358 ppm. Now it's over 410—a level not seen for at least the last three million years. And still rising. CCS projects have proven successful in Decatur, Ill, and two in Texas, and elsewhere including under the North Sea. Internationally, China, Norway, Australia, Japan, certain European countries, South Africa, Saudi Arabia and the United Arab Emirates are all working on CCS.

Washington

In February, Trump reportedly was establishing a12-member Presidential Committee on Climate Security to examine how climate change affects national security. The panel was to include a White House adviser whose views are sharply at odds with the established scientific consensus that human-caused global warming poses a threat to the nation's economy, health and security.

The controversial member was William Happer, a Princeton physicist who serves as Trump's deputy assistant for emerging technologies. Dr. Happer has gained notoriety in the scientific community for his statements that carbon dioxide is beneficial to humanity. He wrote, "More CO2 will benefit the world. The only way to limit CO2 would be to stop using fossil fuels, which I think would be a profoundly immoral and irrational policy."

Due to tremendous negative response, this panel was scrapped. However, the National Security Council intends to move forward more quietly and less publicly with an internal, ad hoc group of scientists designed to provide an "adversarial" peer review of recent climate change findings by the federal science agencies, including the National Climate Assessment—a process that seeks to undermine scientific findings, as opposed to evaluate their soundness, and then feed that into national security policy.

Earlier this month, the director of national intelligence released its 2019 Worldwide Threat Assessment, which concluded that "Global environmental and ecological degradation, as well as climate change, are likely to fuel competition for resources, economic distress, and social discontent through 2019 and beyond. Climate hazards such as extreme weather, higher temperatures, droughts, floods, wildfires, storms, sea level rise, soil degradation, and acidifying oceans are intensifying, threatening infrastructure, health, and water and food security."

The report listed specific threats posed by climate change, such as the threat of rising sea levels to the safety of low-lying military installations and the likelihood that increased drought and flooding could lead to mass human displacement and increased conflict. The report concluded that climate-driven food shortages could increase "the risk of social unrest, migration, and interstate tension in countries such as Egypt, Ethiopia, Iraq and Jordan."

Similarly, the recent National Climate Assessment, a sweeping report issued by the White House in November, concluded decisively that the burning of fossil fuels was warming the atmosphere, leading to a raft of harmful effects across the U.S. and the world.

The Administration stated that such reports had not undergone rigorous, independent, peer review and may now be attempting to fashion such a review.

Trump also announced, on Twitter, that he would nominate Kelly Knight Craft to be his ambassador to the United Nations. Ms. Craft said in a 2017 interview that, on the issue of climate change, there are "scientists on both sides that are accurate."

"She's taken this bizarre position," said R. Nicholas Burns, who served as under secretary of state for political affairs during the George W. Bush administration. "She will find that in New York, at the Security Council, climate change is one of the top issues. If the representa-

tive of the world's largest economy and one of the largest emitters doesn't understand the science of this issue, it makes the U.S. look feckless and irresponsible."

Ms. Craft, currently the US ambassador to Canada, and her husband, Joseph W. Craft III, a billionaire coal magnate from Kentucky, were major contributors to Mr. Trump's 2016 presidential campaign and donated to his inaugural committee.

In February 2019, three top-ranking Republicans on the House Energy and Commerce Committee, Greg Walden of Oregon, Fred Upton of Michigan, and John Shimkus of Illinois, published an op-ed on the website Real Clear Policy stating that "climate change is real" and calling for innovations to "reduce greenhouse gas emissions."

Similarly, in December, Senator John Barrasso, the Wyoming Republican who is chairman of the Senate Environment Committee, wrote an op-ed in The New York Times expressing his acceptance of climate science but also criticized the Paris Agreement and proposals to tax carbon dioxide emissions.

Globally, climate change is seen as the top international threat, according to a poll conducted in 26 countries and published by the Pew Research Center.

Finally, on March 7, 2019, the New York Times published an op-ed by a four-star retired general, John R. Allen, now president of the Brookings Institution, and David G. Victor, a professor at the School of Global Policy and Strategy, University of California at San Diego, and a co-chairman of the Cross-Brookings Initiative on Energy and Climate. Their article made clear that Trump is not only openly denying the conclusions made by his intelligence agencies (and those of 195 other nations), but he is also rejecting the findings of the National Academies of Science, created by President Abraham Lincoln to provide unbiased scientific findings to the country's leaders. No President has ever sought to undermine the Academy which played a key role in reviewing the conclusions of the National Climate Assessment.

General Allen and Professor Victor note that fifty-eight former military and intelligence officials sent a letter to the president warning him that "imposing a political test on reports issued by the science agencies and forcing a blind spot onto the national security assessments that depend on them, will erode our national security."

The article concluded that "[i]gnoring the anti-science noise in the White House is dangerous for the nation. Climate change is arguably America's and its allies' longest-term security crisis. But the immediate national security crisis is a White House browbeating our scientific and intelligence community into its political line or seeking to tamper with the science and intelligence itself."

Facts on the Ground; Extinction Report; Washington

By Carl Howard

Facts on the Ground

A rare tornado warning was issued in the New York region on May 28, causing confusion and concern as a thunderstorm struck. That was unusual. But given the horrific storms in much of the Rocky Mountains, the Midwest and South, why not here? Between April and May alone, tornadoes have caused at least 40 deaths and scores of injuries there.

Floods damaged parts of Oklahoma in late May. The town of Braggs was turned into an island. To get gas, people wrote their names on their gas cans as a friend or neighbor made a gas run by boat to the mainland. There were feed runs for livestock, medicine runs, and grocery runs. Power was lost for days and more than a dozen people—including children and the elderly—were evacuated by two of the Oklahoma National Guard's Black Hawk helicopters.

Storms also flooded the Arkansas River. Nearly everyone and everything had to be transported by air or by water. Floodwaters stretched about a mile over Highway 10, a main artery so submerged that even common landmarks were unrecognizable.

In Arkansas, the river topped two flood levees in Logan and Perry Counties, and shelters opened in Fort Smith, Ark. In Oklahoma, all 77 of the State's counties were in a state of emergency The Oklahoma Department of Emergency Management reported six fatalities and 107 injuries attributed to the flooding and severe weather.

The Army Corps of Engineers increased the release of water into the flooded Arkansas River from the Keystone Dam in Oklahoma to 275,000 cubic feet per second, hoping to keep the rising water from overtopping the dam's spillway.

"We are planning for and preparing for the flood of record, and we think everybody along the Arkansas River corridor ought to be doing the same," the mayor of Tulsa, G.T. Bynum, told reporters. "It's a high-risk situation when you're talking about infrastructure that's being tested in such a strong way."

In the Kansas City-area, tornadoes and destruction, 12 straight days of it, was the story. Storms destroyed

homes and structures across a wide swath. Multiple tornadoes also hit Ohio and Indiana destroying homes and knocking down power lines. At least one death was reported. Federal government weather forecasters logged preliminary reports of more than 500 tornadoes in a 30-day period—a rare figure.

May 28 was the 12th consecutive day with at least eight tornado reports, breaking the record. "We are flirting in uncharted territory," said Patrick Marsh, the warning coordination meteorologist at the National Weather Service's Storm Prediction Center in Norman, Okla. "Typically, you'd see a break of a day or two in between these long stretches, but we're just not getting that right now."

Climate change is increasingly linked to extreme weather, but limited historical information, especially when compared with temperature data that goes back more than a century, has made it difficult for researchers to determine whether rising temperatures are making tornadoes more common and severe. But as records fall, the facts speak for themselves.

At least 10 tornados touched down across six counties in Ohio, causing spotty phone service, blocking streets, boil-water advisories and evacuations. Tens of thousands of homes lost electricity as emergency workers went door-to-door in some communities searching for victims. Ohio Task Force One, an elite search-and-rescue team, was assigned to work in part of Montgomery County.

Mike Robbins, the emergency management director for Mercer County, O.H., reported that an 81-year-old man was killed when powerful winds picked up a vehicle and slammed it into his home. At least 40 homes were destroyed or seriously damaged by the storm, which the Weather Service rated as at least an EF3 tornado, with winds of 136 miles per hour or higher.

Due to this unprecedented run of storms, the nation's tornado death toll has reached its highest level since 2014. So far this year, of the 40 tornado-related deaths in the U.S., most were in Beauregard, Ala., where 23 people were killed in early March. At least eight states have had tornado-related fatalities since Jan. 1.

Damage also was reported in Indiana from violent storms, as well as lethal tornadoes which killed three people and injured at least 20 in Jefferson City, Mo. The tornado was part of a band of storms that raged through the Plains and the Midwest. One struck the Missouri capital destroying buildings, felling power poles and sparking a vast emergency response as people were trapped in rubble. State troopers and local emergency personnel went door-to-door searching for survivors. At least three people were killed by a tornado in Golden City, southeast of Kansas City.

In Jefferson City, officials said that roughly three square miles had been especially hard-hit and that flying trees and debris were responsible for some of the at least 20 injuries that had been tallied in the capital.

In April, the South suffered lethal storms which killed three, including two children, in Texas. The children, who were 3 and 8, were in a car hit by a tree blown over in Pollok, Tex.

The National Weather Service said severe storms and damaging wind and hail hit many areas across the South, particularly from eastern Texas to western Alabama. "I've seen tornadoes but nothing like this," Sheriff James E. Campbell of Cherokee County told a local news station.

Internationally, in early May, a rare summer cyclone, "Fani", forced the evacuation of millions of people in South Asia killing at least 34 people in India and 15 people in Bangladesh and destroying hundreds of homes. Categorized by the India Meteorological Department as "extremely severe" when it made landfall in India, the cyclone lashed coastal areas with heavy rain and winds of up to 127 miles per hour.

Casualties in South Asia were fewer than those caused by previous, similar cyclones. Preparations in India for Cyclone Fani demonstrated greatly improved disaster readiness since 1999, when a "super" cyclone killed about 10,000 people and devastated large parts of the state.

In preparation for Cyclone Fani, more than 1 million people were evacuated from about 15,000 villages and 46 towns in India's Odisha state. The cyclone forced the evacuation of more than 1.6 million people in Bangladesh. Authorities in both countries sent warning text messages to tens of millions of people in the storm's path, and in Bangladesh, thousands of volunteers went through villages with megaphones, urging residents to move to shelters.

Cyclone season in the region typically runs from April to December, with activity peaking in May and November. Cyclone Fani is one of the rarest of rare summer cyclones to hit Odisha in 43 years. It is also one of three to hit in the last 150 years.

Extinction Report

A recent 1,500-page report by the United Nations is the most exhaustive look yet at the decline in biodiversity across the globe. Its alarming message is that humans are speeding the extinction of perhaps a million plant and animal species and altering the natural world at an unprecedented pace. Such destruction poses a dire threat to ecosystems that people all over the world depend on for their survival.

The report, compiled by hundreds of international experts and based on thousands of scientific studies, is the most exhaustive examination yet at the decline in global biodiversity and the resulting danger for the future of human civilization. A summary of its findings, approved by

132 countries including the US, was released in early May. The full report is due later this year.

The report bluntly states that in most major land habitats, from Africa's savannas to South America's rain forests, the average abundance of native plant and animal life has decreased 20% or more, mainly in the past century. Increasing pressure from the human population, which exceeds 7 billion, and activities including farming, logging, poaching, fishing and mining are altering the natural world at a rate "unprecedented in human history."

Global warming is specified as a new threat and a key driver of wildlife decline, by altering or shrinking the local climates that many mammals, birds, insects, fish and plants evolved to survive in. Combined with the above-noted human activities damaging the environment, climate change is rushing a growing number of species, such as the Bengal tiger, toward extinction.

Biodiversity loss is projected to accelerate through 2050, especially in the tropics, unless countries drastically increase their conservation efforts.

The report details how closely human well-being is dependent upon the health of other species.

A previous report by the group estimated that, in the Americas, nature provides $24 trillion of non-monetized benefits to humans each year. The Amazon rain forest absorbs immense quantities of carbon dioxide which slows the pace of global warming. Wetlands purify drinking water. Coral reefs sustain tourism and fisheries in the Caribbean. Exotic tropical plants are used to produce a variety of medicines.

All of these natural landscapes are declining and so too are the services they provide and upon which humans depend. (Remember my Life Pyramid? See Blog 1.)

Human food production is higher than ever, but land degradation is harming agricultural productivity on 23% of the planet. The decline of wild bees and other pollinating insects is putting at risk about $577 billion in annual crop production. The loss of coastal mangrove forests and coral reefs could expose up to 300 million people to increased risk of flooding.

The authors note that so much devastation of nature has occurred that traditional piecemeal efforts to protect individual species and isolated wildlife refuges will not suffice. The report calls for "transformative changes" to wasteful consumption, agriculture's environmental footprint and illegal logging and fishing.

"It's no longer enough to focus just on environmental policy," said Sandra M. Díaz, a lead author of the study and an ecologist at the National University of Córdoba in Argentina. "We need to build biodiversity considerations into trade and infrastructure decisions, the way that health or human rights are built into every aspect of social and economic decision-making."

Scientists have cataloged perhaps 1.3 million of the approximate 8 million plant and animal species on the planet, most of them insects. Since 1500, at least 680 species have gone extinct, including the Pinta giant tortoise of the Galápagos Islands.

The report notes that the current extinction rate is tens to hundreds of times higher than in the past 10 million years. "Human actions threaten more species with global extinction now than ever before … around 1 million species already face extinction, many within decades, unless action is taken."

"Over the past 50 years, global biodiversity loss has primarily been driven by human activities including clearing of forests for farmland, expansion of roads and cities, logging, hunting, overfishing, water pollution and the transport of invasive species around the globe."

Absent significant changes, the planet may lose 40% of amphibian species, one-third of marine mammals and one-third of reef-forming corals. More than 500,000 land species have insufficient natural habitat to ensure long-term survival.

Over the past 50 years, global biodiversity loss has primarily been driven by human activities including clearing of forests for farmland, expansion of roads and cities, logging, hunting, overfishing, water pollution and the transport of invasive species around the globe.

In Indonesia, the rain forest has largely been replaced by palm oil plantations which has pushed the now critically endangered orangutans and Sumatran tigers to the brink of extinction. In Mozambique, ivory poachers slaughtered nearly 7,000 elephants between 2009 and 2011 alone. In Argentina and Chile, the introduction of the North American beaver in the 1940s devastated native trees (but helped other species such as the Magellanic woodpecker).

In all, human activity has significantly altered three-quarters of the world's land area including the destruction of 85% of the world's wetlands, since the 18th century.

Given the lack of progress in reducing the burning of fossil fuels, global warming likely will compound the damage. Roughly 5% of species worldwide are threat-

ened with climate-related extinction if global average temperatures rise 2 degrees Celsius above preindustrial levels, having already warmed 1 degree C.

"If climate change were the only problem we were facing, a lot of species could probably move and adapt," Richard Pearson, an ecologist at the University College of London, said. "But when populations are already small and losing genetic diversity, when natural landscapes are already fragmented, when plants and animals can't move to find newly suitable habitats, then we have a real threat on our hands."

The extinction of species not only makes the world a less wondrous place, it also poses risks to people. We rely on significantly fewer varieties of plants and animals to produce food than in the past. Of the 6,190 domesticated mammal breeds used in agriculture, more than 559 have gone extinct and 1,000 more are threatened. This makes the food system less resilient against pests and diseases. It likely will be harder in the future to breed new, hardier crops and livestock to cope with the extreme heat and drought that climate change has brought.

To date, more than 15% of the world's land and 7% of its oceans have been protected as nature reserves and wilderness areas. But only a fraction of the most important areas for biodiversity have been protected, and many reserves are protected on paper only and still suffer from poaching, logging and/or illegal fishing. Climate change is expected to further undermine existing wildlife refuges by shifting the geographic ranges of species that currently live within them.

In addition to advocating the expansion of protected areas, the report outlines numerous changes to limit the drivers of biodiversity loss. Farmers and ranchers must adopt new techniques to grow more food on less land. Consumers in wealthy countries must waste less food and use natural resources more efficiently. Governments must strengthen and enforce environmental laws, especially on illegal logging and fishing and reducing the discharge of heavy metals and untreated wastewater into the environment.

The authors state that limiting global warming will be critical, although they caution that the development of biofuels to reduce carbon emissions could end up harming biodiversity by further destroying forests.

Complicating these efforts is the fact that many developing countries face pressure to exploit their natural resources to combat poverty.

"You can't just tell leaders in Africa that there can't be any development and that we should turn the whole continent into a national park," said Emma Archer, who led the group's earlier assessment of biodiversity in Africa. "But we can show that there are trade-offs, that if you don't take into account the value that nature provides, then ultimately human well-being will be compromised."

In the next two years, diplomats from around the world will meet for the Convention on Biological Diversity, a global treaty, to discuss how they can increase their efforts at conservation. Even in the new report's most optimistic scenario, through 2050 the world's nations would only slow the decline of biodiversity—not stop it.

"At this point," said Jake Rice, a fisheries scientist who led an earlier report on biodiversity in the Americas, "our options are all about damage control."

Washington

Trump has continued to question not just the existence of climate change but now intends to undermine the science supporting it. The Trump-appointed director of the United States Geological Survey, James Reilly, a petroleum geologist, ordered that scientific assessments produced by that office use only computer-generated climate models that project the impact of climate change through 2040, rather than through the end of the century, as had been done in previous assessments.

Scientists say that will give a misleading picture because the impact from current emissions will be felt after 2040. Models predict that the planet will warm at about the same rate through about 2050. From that point until the end of the century, however, the rate of warming differs significantly with an increase or decrease in carbon emissions.

The administration intends that the next National Climate Assessment, produced by an interagency task force about every four years since 2000, contain less-alarming predictions than the one issued this past year. The most recent report stated that if fossil fuel emissions continue unchecked, the earth's atmosphere could warm by as much as eight degrees Fahrenheit by the end of the century resulting in drastically higher sea levels, more devastating storms and droughts, crop failures, food losses and severe health consequences.

The next assessment, expected to be released in 2021 or 2022, is under way. Trump has directed that worst-case scenario projections will not automatically be included in the National Climate Assessment or in other scientific reports produced by the government.

"What we have here is a pretty blatant attempt to politicize the science—to push the science in a direction that's consistent with their politics," said Philip B. Duffy, the president of the Woods Hole Research Center, who served on a National Academy of Sciences panel that reviewed the government's most recent National Climate Assessment. "It reminds me of the Soviet Union."

As a result, parts of the federal government will no longer fulfill what scientists say is one of the most urgent jobs of climate science studies: reporting on the future effects of a rapidly warming planet and presenting a picture of what the earth could look like by the end of the century if humanity continues to emit heat-trapping carbon dioxide pollution from burning fossil fuels.

James Hewitt, a spokesman for the EPA, defended the proposed changes: "The previous use of inaccurate modeling that focuses on worst-case emissions scenarios, that does not reflect real-world conditions, needs to be thoroughly re-examined and tested if such information is going to serve as the scientific foundation of nationwide decision-making now and in the future," Mr. Hewitt said.

To further question climate science, Trump has proposed a new climate review panel. That effort may be led by William Happer, a 79-year-old physicist who had a respected career at Princeton but is now known for attacking the science of man-made climate change and for defending the virtues of carbon dioxide.

"The demonization of carbon dioxide is just like the demonization of the poor Jews under Hitler," said Mr. Happer, who serves on the National Security Council as the president's deputy assistant for emerging technologies.

Mr. Happer's proposed panel is backed by John R. Bolton, the president's national security adviser, who brought Mr. Happer into the N.S.C.

Both Happer and Bolton are beneficiaries of Robert and Rebekah Mercer, the far-right billionaire and his daughter who have funded efforts to debunk climate science. The Mercers are major contributors to a super PAC affiliated with Mr. Bolton before he entered government and to an advocacy group headed by Mr. Happer.

Trump has pushed to resurrect the idea of a series of military-style exercises, known as "red team, blue team" debates, on the validity of climate science first promoted by Scott Pruitt, the EPA administrator who was forced to resign last year amid multiple scandals.

The idea was defeated by John F. Kelly, then the White House chief of staff. But Trump now envisions using Happer's panel as a forum for it. Trump's views may be influenced by donors like Carl Icahn, the New York investor who owns oil refineries, and the oil-and-gas billionaire Harold Hamm—both of whom pushed Trump to deregulate the energy industry.

Secretary of State Mike Pompeo appears to share Trump's disregard for climate change. At a recent meeting of the eight-nation Arctic Council, he described the rapidly warming region as a land of "opportunity and abundance" because of its untapped reserves of oil, gas, uranium, gold, fish and rare-earth minerals. The melting sea ice, he said, was opening new shipping routes which the U.S. (and China and the Soviet Union) intend to exploint.

"That is one of the most crude messages one could deliver," said R. Nicholas Burns, the NATO ambassador under George W. Bush.

At the National Security Council, under Mr. Bolton, officials said they had been directed to delete references to global warming from speeches and formal statements.

Scientists said that eliminating the worst-case scenario would give a falsely optimistic picture. "Nobody in the world does climate science like that," said Michael Oppenheimer, a professor of geosciences and international affairs at Princeton. "It would be like designing cars without seatbelts or airbags."

Internationally, climate scientists have given up on the White House being anything but on outlier in policy. The loss of U.S. leadership as a source for reliable climate research is profound.

"It is very unfortunate and potentially even quite damaging that the Trump administration behaves this way," said Johan Rockström, the director of the Potsdam Institute for Climate Impact Research in Germany. "There is this arrogance and disrespect for scientific advancement—this very demoralizing lack of respect for your own experts and agencies."

Facts on the Ground; Big News From N.Y.; Good News; Washington

By Carl Howard

Facts on the Ground

Hurricane Barry, the first of the season, had sustained winds of 75 mph on July 13 and flooded coastal Louisiana. Its immense scope reached much of the midwest, southeast, the Gulf Coast, Arkansas, Oklahoma, the Great Lakes region, the northeast and southern Ontario. Over 23" of rain fell in Los Angeles, the French Quarter was flooded, a flash-flood emergency was declared in New Orleans and a tornado struck the Gentilly neighborhood there. Governor John Bel Edwards declared a state of emergency, deployed search and rescue teams and requested a federal disaster declaration for the entire state on July 11 which was granted. Over 150,000 electrical customers lost power in Los Angeles.

July in Alaska set numerous records for warmth. Beginning July 4 and lasting several days, temperatures across Alaska were 20 to 30 degrees above average in some locations. On July 4, all-time high temperature records were set in Kenai, Palmer, King Salmon, and Anchorage International Airport. The airport reached an astounding, for Alaska, 90°F, breaking the previous all-time record by 5°F! The average temperature in Anchorage during summer is normally in the mid-sixties. Anchorage, Talkeetna (which saw a July record daily high of 93°F), and King Salmon also observed their warmest week on record. Through July 10, Juneau saw the high temperature reach at least 70°F for a record 17 consecutive days. In Anchorage, the highs reached 80°F for a record six consecutive days, doubling the previous record. And three of those days broke or tied the previous all-time record! The average high temperature from June 27 through July 8 was nearly 81°F, 5.5°F higher than the previous 12-day record. These are staggering numbers and genuine cause for concern.

Here is a brief global tour of record-setting weather for the first half of 2019 featuring extreme, high-impact weather including record heat, wildfires and rainfall in South America and Australasia, dangerous and extreme cold in North America, and heavy snowfall in the Alps and Himalayas.

Globally, temperatures in January were a little over 0.4°C warmer than average from 1981-2010, according to the EU's Copernicus Climate Change Service. Australia experienced its warmest January on record, Adelaide set a record at 46.6C, and had a series of heatwaves unprecedented in scale and duration. Exceptionally warm weather covered much of the Middle East, eastern Siberia, Mongolia and northeastern China. Australia faced additional extremes including record rainfall in Queensland (Townsville received one year's rainfall in nine days). But Tasmania had its driest January on record.

Warming trends are not limited to land. Sea surface temperatures (SSTs) have warmed in the Tasman Sea with anomalies of +2.0˚C to 4.0˚C. Given that SSTs were significantly warmer than average for weeks on end, marine heatwave conditions likely occurred in parts of the Tasman Sea and New Zealand coastal waters.

In South America, extreme weather in the form of heat, drought and precipitation affected large parts of the continent in January and February. Intense rainfall caused damage and casualties in Bolivia, Peru and northern Chile in early February, while heat records were set in southern part of the continent (Patagonia exceeded 30C in February leading to wildfires in Tierra del Fuego).

Northeast Argentina, and adjacent parts of Uruguay and Brazil were hit with extensive flooding from heavy rainfall. On January 8, the Argentine city of Resistencia recorded 224mm rainfall, a new 24-hour rainfall record.

In Brazil, January 2019 continued the trend of rising heat in 2014, 2015, 2016, 2017 and 2018, with heatwaves setting regular historical record highs (São Paulo reached 37.4C, the second hottest since 1961). Brasilia experienced the third driest January in 57 years of measurements, with a cumulative of 70.9mm of rainfall.

Weather extremes were measured throughout Chile. Rain in the Andes led to damaging flooding in the Atacama desert, normally one of the driest places on Earth, and caused a 60 meter waterfall that had been dry for 10 years to be reactivated by the flooding. In the south, record temperatures led to more than 600 forest fires burning nearly 10,000 hectares of land and the declaration of disaster areas.

The capital, Santiago, set a record of 38.3°C on 26 January. In central Chile, temperatures exceeded 40°C. In Patagonia in February, for the first time ever, Porvenir and Puerto Natalaes in the southern tip of the country exceeded 30°C.

As you will recall, large parts of North America experienced an influx of Arctic air late January. In southern Minnesota, the wind chill factor reached minus 65°F (-53.9°C) on January 30. The national low temperature record was measured at minus 56°F (-48.9°C). While this Polar Vortex is not a new phenomenon, there is increasing research suggesting that it is being impacted by climate change.

The first week of February set a record temperature swing in the US. Several record high temperatures were broken or tied across parts of the Eastern US on 4 February, included 59°F (15°C) in Buffalo, New York, and 61°F (16°C) in Syracuse, New Jersey. Miami set a heat record on June 23 (95F) and June 24 (98F) tied a record.

"In general, and at global level, there has been a decline in new cold temperature records as a result of global warming. But frigid temperatures and snow will continue to be part of our typical weather patterns in the northern hemisphere winter. We need to distinguish between short-term daily weather and long-term climate," said World Meteorological Organization's Secretary-General Petteri Taalas. (As I write, a friend in Teluride, CO, informs me that skiing there is currently insane with snow levels 3700% of average. And snow is forecast for Banff, Canada.)

"Arctic has faced warming, which is twice the global average. A large fraction of the snow and ice in the region has melted. Those changes are affecting weather patterns outside the Arctic in the Northern Hemisphere. A part of the cold anomalies at lower latitudes could be linked to the dramatic changes in the Arctic. What happens at the poles does not stay at the poles but influences weather and climate conditions in lower latitudes where hundreds of millions of people live," he said.

The eastern USA and parts of Canada saw record-breaking cold temperatures, but Alaska and large parts of the Arctic have been warmer than average.

The Ottawa airport received a record 97 cm of snow on 29 January, beating the 1999 record of 93 cm. Winter snowstorms and heavy snowfall are not inconsistent with weather patterns under a changing climate.

Parts of the European Alps saw record snowfalls in January. In Hochfilzen in the Tirol region of Austria, more than 451 centimeters (cm) of snow fell in the first 15 days of January, an event statistically expected once a century. Other resorts in Tirol also received once-in-a-century snowfalls. Eastern Switzerland received twice as much snow as the long-term average.

The German weather service or Deutscher Wetterdienst, DWD, issued several of its highest snow and winter weather warnings. Climate projections anticipate that winter precipitation in Germany will intensify, necessitating adaptation measures including new regulations for buildings to withstand the weight of additional snow.

Also in January, severe winter storms struck the eastern Mediterranean and parts of the Middle East, with particularly severe impacts on vulnerable populations including refugees.

A cold front in the third week of January that swept south through the Arabian Peninsula, brought a huge dust storm from Egypt to Saudi Arabia, Bahrain, Qatar, Iran and the United Arab Emirates, and heavy rain and precipitation to Pakistan and northwest India.

The Indian Meteorological Department issued warnings on January 21 of heavy or very heavy rain and snow for Jammu and Kashmir and Himachal Pradesh, prompting warnings of avalanches amid an intense cold wave.

And continuing my focus on melting ice sheets, soaring temperatures are speeding the Spring thaw of Greenland's glaciers. In early June, the temperature was 40F above normal. That, coupled with cloudless conditions, led to rapid melting across much of the ice sheet surface (across 275,000 square miles, or about 45% of the surface to be exact). That represents a record early date for such extensive melting, which has been measured by satellites since 1979.

The early melt is in keeping with the overall trend in the Arctic, where the warming effects of climate change are amplified. Overall, the region is warming about twice as fast as the global average.

In 2012 high-pressure air returned in July and August, leading to record ice-sheet melting for the year—in all, Greenland had a net loss of about 200 billion tons of ice that year. (If you want to see dramatic footage of what such massive melting looks like, see Gore's film, Inconvenient Sequel.)

Greenland's ice sheet is more than a mile thick. If the entire ice sheet melted it would raise sea levels by about 20 feet. Melting since the early 1970s has raised sea levels by about a half inch. But the pace of melting is accelerating as is the rate of seal level rise.

Sea ice loss contributes to the amplification of Arctic warming, as the darker water of open ocean absorbs more sunlight than ice.

Climate change is also melting the glaciers of the Himalayas, posing a grave threat to hundreds of millions of people who live downstream, a study based on 40 years of satellite data has shown.

The study concluded that the glaciers have lost a foot and a half of ice every year since 2000, melting at a far faster pace than in the previous 25-year period. In recent years, the glaciers have lost about eight billion tons of water a year.

The study adds to a growing and grim body of work that points to the dangers of global warming for the Himalayas, which are considered the water towers of Asia and an insurance policy against drought.

In February, a report produced by the International Center for Integrated Mountain Development warned that the Himalayas could lose up to a third of their ice by the end of the century, even if the world community can fulfill its most ambitious goal of keeping global average

temperatures from rising only 1.5C degrees above preindustrial levels.

That goal, which scientists have identified as vital to avert catastrophic heat waves and other extreme weather events, is nowhere close to being met. Average global temperatures have already risen 1C in the last 150 years. Greenhouse gas emissions continue to climb. And scientists estimate that we likely will raise the average global temperature between 3 to 5 degrees Celsius by the end of this century.

Another study, published in May in Nature, found that Himalayan glaciers are melting faster in summer than they are being replenished by snow in winter. In the warm seasons, meltwater from the mountains feeds rivers that provide drinking water and irrigation for crops. Water scarcity may create millions of environmental refugees from this area by the end of the century. (Recent reporting from India informs that one of its larger cities, Chennai, with 4.6 million people, is virtually without water.)

The latest study, led by researchers at the Lamont-Doherty Earth Observatory at Columbia University, relied on the analysis of satellite images of 650 glaciers across more than 1,200 miles of the Himalayas, including recently declassified United States spy satellite data.

From 1975 to 2000, glaciers across the region lost 10 inches of ice each year. Starting in 2000, the rate of loss doubled, to about 20 inches of ice each year. The study also concluded that while soot from fossil fuel burning is likely to have contributed to the ice melt, the main driver was rising temperatures. On average the temperature rose faster between 2000 and 2016 compared with earlier years. Data from more recent years will continue this dangerous trend.

Big News From N.Y.

Governor Cuomo has stated that he intends to sign legislation committing New York to ambitious climate goals. In one of the world's most far-reaching climate plans, the Climate Leadership and Community Protection Act requires the state to reduce its carbon emissions 85% below 1990 levels by 2050, and offset the remaining 15%, perhaps via removing carbon dioxide from the atmosphere. By 2030 the state must get 70% of its electricity from renewable sources and, by 2040, achieve zero carbon emissions from electricity use (a "net-zero economy" essential to slow the pace of global warming).

Details are yet to be established, but certain big-picture goals are clear including the phase out of gasoline-powered cars via pushing automakers to accelerate the production of electric vehicles (transportation makes up one-third of the state's emissions); the replacement of oil and gas-burning heaters and boilers with electric-powered boilers (about one-quarter of New York's emissions come from heating and cooling homes and commercial buildings); and a major push on solar and wind (mostly off-shore).

The plan is for industries to bear most of the associated costs, with grants and incentives to assist low-income residents. The measure is intended to boost the state economy via the creation of green jobs for solar and wind-power generation on buildings and off-shore. The City's 24 power plants will be converted or dismantled, many of which are in low-income areas and contribute to elevated asthma rates which should be reduced under the new legislation. The bill requires that the plan direct more than a third of its financial and community benefits to low-income communities of color that have suffered disproportionate environmental harm.

"New York currently produces about 60% of its electricity from carbon-free sources, mostly from hydroelectric dams and nuclear power plants, with small amounts of wind and solar power. To achieve its new goals, the state plans to erect huge off-shore wind turbines, expand rooftop solar programs and utilize large new batteries to handle and store the renewable power."

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A recent study found that 141,000 jobs could be created to meet the city's requirements to reduce skyscraper emissions alone. The state law could create hundreds of thousands of jobs in fields like retrofitting and renewable energy. The wind power plans alone should create many jobs in construction, ports and supply-chain work.

While the deadlines for major emissions reductions are a decade away, the state has two years to produce specific recommendations on how to meet the goals. Needless to say, the challenges of reaching such goals are daunting. New York has so far only managed to reduce its emissions 8% between 1990 and 2015.

New York City is particularly vulnerable to flooding from storm surges and sea level rise, especially lower Manhattan. In March, Mayor Bill de Blasio proposed a $10 billion project to protect Lower Manhattan from flooding, and he asked the federal government to pay for it.

Elsewhere, in April, the Army Corps of Engineers said the levee system around New Orleans, upgraded after Hurricane Katrina at a cost of $14 billion, is sinking, and could fail in as little as four years. In May, officials in Charleston, SC, held a public meeting on where to find the estimated $2 billion necessary to upgrade its infrastructure for climate change. In Florida, Resilient Analytics and the Center for Climate Integrity, estimated that Florida may have to build $76 billion worth of sea walls by 2040.

The cities that are pro-active adapting to climate risks "are going to attract the jobs and the factories of the future," said Eric Smith, president and chief executive officer for the Americas at Swiss Re, one of the world's largest reinsurance companies. "There's going to be communities that I think will be left way, way behind."

"Recent research identifies 241 cities of 25,000 people or more that will require at least $10 million worth of sea walls by 2040 just to protect against a typical annual storm."

Recent research identifies 241 cities of 25,000 people or more that will require at least $10 million worth of sea walls by 2040 just to protect against a typical annual storm.

For NYC, under the mayor's new $10 billion plan, the waterfront of the Financial District will be extended up to 500 feet into the East River to protect against flooding.

Six years ago, Hurricane Sandy flooded 51 square miles of the city. Seventeen thousand homes were damaged or destroyed. Forty-four New Yorkers lost their lives.

The Mayor noted that across the U.S. cities are grappling with the same existential threat. But nowhere in the $4.75 trillion budget Trump proposed is there anything approaching a plan to protect coastal cities from rising seas.

The pattern has been that major federal funding only follows 'natural' disasters. Such investments have helped protect the Rockaway peninsula with new, reinforced sand dunes nearly 20 feet above sea level. A new $615 million sea wall will protect the east shore of Staten Island—another vulnerable area flooded by Sandy.

Approximately a half-billion dollars will be needed to fortify Lower Manhattan with grassy berms in parks and removable barriers than can be anchored in place as storms approach. But the South Street Seaport and the Financial District are just eight feet above sea level and are so crowded with utilities, sewers, and subway lines that flood protection cannot be built on the land there. The larger plan is to build more land itself, from the Brooklyn Bridge to the Battery. The new land will be higher than the current coast, protecting the neighborhoods from future storms and the higher tides that will threaten its survival in the decades to come (but only through 2100).

The mayor called this infrastructure just as vital as roads, rails, and bridges. "It's national security, just as critical to keeping people safe as any military hardware. Preparing for climate change has to be a national priority, backed by tens of billions in federal investment. Lives are on the line."

Tom De Napoli, NYC's Comptroller, spoke at a NYSBA EEL NYC annual meeting luncheon. I asked him why the City had not divested its pension funds from fossil-fuel companies and he said he thought it best to have a seat at the table. Now, finally, the mayor said the City is divesting.

The mayor said that NYC, like Miami, Houston, Charleston and all coastal cities, face an existential threat and must respond. And we need federal assistance. We'll see what happens.

(For more, see my co-chair Michael Gerrard's recent op-ed piece in the NY Daily News: http://www.nydailynews.com/opinion/ny-oped-start-innovating-new-york-20190623-3mucksnuazak3axgpggpygxtly-story.html.)

Good News

Judge Brian Morris of the United States District Court of the District of Montana delivered yet another significant setback to the Trump administration's policy of promoting coal, ruling that the Interior Department action was "arbitrary and capricious" when it sought to lift an Obama-era moratorium on coal mining on public lands.

The decision does not reinstate President Obama's 2016 freeze on new coal mining leases on public lands. A second opinion will address whether to do so.

The court did say that the 2017 Trump administration policy, enacted by former Interior Secretary Ryan Zinke, to overturn Mr. Obama's coal mining ban did not include adequate studies of the environmental effects of the mining, as required by the National Environmental Policy Act of 1970.

More than 40% of the coal produced in the US comes from federal land, and most of the planet-warming GHG comes from burning coal.

Efforts by Trump to deliver on his campaign promise to help the coal industry and roll back Obama's environmental policies have repeatedly been blocked by the courts, often for reasons similar to those given by Judge Morris.

This is the latest in about 40 such courtroom losses for efforts by Trump to undo Obama's environmental rules.

"Efforts by Trump to deliver on his campaign promise to help the coal industry and roll back Obama's environmental policies have repeatedly been blocked by the courts, often for reasons similar to those given by Judge Morris."

The Court of Appeals for the Ninth Circuit gave EPA 90 days to decide whether it will ban chlorpyrifos, a pesticide linked to brain damage. While the Obama administration had recommended banning the chemical, based on the recommendations of EPA scientists, Trump has sought to allow the agriculture industry to continue to use the chemical.

A federal judge in Alaska recently found unlawful an executive order by Trump that lifted an Obama-era ban on oil and gas drilling in the Arctic Ocean and parts of the North Atlantic coast.

Washington

The Trump administration replaced former President Obama's Clean Power Plan to reduce planet-warming pollution from coal plants with a new rule that would allow plants to stay open longer and slow progress on cutting carbon emissions.

The Obama plan was to set national emissions limits and mandate the reconstruction of power grids to move utilities away from coal. The new measure gives states broad authority to decide how far, if at all, to reduce emissions.

"The Affordable Clean Energy rule gives states the regulatory certainty they need to continue to reduce emissions and provide affordable energy to all Americans," said Andrew Wheeler, the EPA administrator.

Mr. Wheeler said that the Obama administration overreached its authority with its Plan which was suspended by the Supreme Court after challenges from 28 states and hundreds of companies.

The new rule likely will prompt legal challenges, this time from environmental groups, that could have far-reaching implications for global warming. If the Supreme Court ultimately upholds the administration's approach to pollution regulation, it could close a key avenue that future presidents could use to address climate change.

At issue is whether the EPA has authority to set national restrictions on carbon emissions and force states to move away from coal, as assumed under Mr. Obama's rule. Under the Trump administration's interpretation, the agency only has authority over environmental infractions at individual plants, like chemical spills and improper handling of hazardous materials.

The new rule, which is expected to come into effect within 30 days of issuance, assumes that market forces will guide the country toward cleaner energy by naturally phasing out coal over time. It imposes only modest requirements on coal plants.

While it instructs states to reduce emissions, the new measure sets no targets. Instead, it gives states broad latitude to decide how much carbon reduction they consider reasonable and suggests ways to improve efficiency at individual power plants.

Mr. Wheeler maintained that his plan will reduce carbon emissions in the power sector by 34% below 2005 levels, roughly equal to the goals of the Clean Power Plan.

Mr. Wheeler noted that from 2005 to 2017, the US reduced its energy-related carbon emissions by 14%. He did not mention that they rose in 2018 and are on track to continue growing this year.

"We're on the right side of history," he said. "It's Congress' role to draft statutes, not the regulatory agencies."

According to a joint study produced last year by Harvard University, Syracuse University and Resources for the Future, a research organization, 18 states and the District of Columbia would experience higher GHG emissions from the Trump rule. In 19 states, pollutants like sulfur dioxide and nitrogen oxide emissions would increase.

An early Trump administration analysis of its own plan also found that it would lead to hundreds more premature deaths and hospitalizations due to increased air pollution.

The Natural Resources Defense Council, an environmental group, issued an analysis that estimated, based on established EPA methods of calculating the harm from pollution and industry trends, that the new plan could lead to as many as 5,200 premature deaths annually by 2030.

Facts on the Ground; World's Food Supply; Water Crisis; N.Y. Offshore Wind; Washington

By Carl Howard

Facts on the Ground

The U.S. women's soccer team beat and heat and the Netherlands to win the World Cup. The Tour de France rode through record-breaking heat. But in NYC, I was denied the opportunity to compete in my 10th NYC Triathlon as the heat forced the cancellation of the event for the first time ever.

It's summer and it's record-breaking hot in many places globally. The Arctic, including much of Siberia, is warming at least twice as fast as the rest of the world, and the permafrost—"permanently" (i.e., year-round) frozen ground—is thawing. As it thaws it releases huge amounts of methane, a potent greenhouse gas which threatens to trigger a possibly irreversible 'positive" feed-back loop: the more methane released the warmer the atmosphere; the warmer the atmosphere the more permafrost thaws releasing more methane.

At the local level, the loss of permafrost deforms the landscape, makes farming hard if not impossible, knocks down houses and barns, and disrupts migration patterns of animals hunted and relied on by indigenous peoples for centuries. Severe floods wreak havoc almost every spring threatening entire villages with permanent inundation. Waves erode the less frozen Arctic coastline. The loss of permafrost also afflicts the regional capital, Yakutsk. Subsiding ground has damaged about 1,000 buildings, while roads and sidewalks require constant repair.

"Everything is changing, people are trying to figure out how to adapt," said Afanasiy V. Kudrin, 63, a farmer in Nalimsk, a village of 525 people above the Arctic Circle. "We need the cold to come back, but it just gets warmer and warmer and warmer."

"People don't comprehend the scale of this change, and our government is not even thinking about it," said Aleksandr N. Fedorov, deputy director of the Melnikov Permafrost Institute, a research body in Yakutsk.

In a regionwide pattern, the average annual temperature in Yakutsk has risen more than four degrees, to 18.5 F from 14 F, over several decades, said Mr. Fedorov.

Warmer winters and longer summers are steadily thawing the frozen earth that covers 90% of Yakutia. The top layer that thaws in summer and freezes in winter can extend down as far as 10 feet where three feet used to be the maximum.

The government is also unable to address other environmental problems, including wildfires surging through millions of acres of remote forest across Siberia. Reaching them is too costly.

European climate researchers declared last July the hottest month ever recorded, eclipsing the previous record-holder, July 2016. This continues a long-term trend: The past five years have been the hottest on record, including the record single year in 2016. The 10 hottest years have all occurred in the past two decades. This June was the warmest on record, and the previous five months were among the four warmest for their respective months. That puts this year on track to be in the top five, or perhaps the hottest ever.

Temperature records were set in Paris (108.6 F), France, in Germany (108.7), Belgium (105), and the Netherlands (104), and Cambridge, England, (100.5). "This is only the second time temperatures over 100 Fahrenheit have been recorded in the U.K.," the Met Office tweeted. World Weather Attribution found that climate change made the heat wave more likely. (In the US, Phoenix had 128 days at or above 100F last year and can expect that to be its new normal.)

The highest above-average conditions were recorded across Alaska, Greenland and large swathes of Siberia. Large parts of Africa and Australia were warmer than normal, as was much of Central Asia. Nuclear reactors in France and Germany were forced to reduce output or shut down because the water used to cool them was too warm.

As uncomfortable as Europe's heat wave was (and many deaths were attributed to it), the larger danger comes from the melting ice caps on Greenland which is where the heat wave hit after Europe. Greenland's ice sheets melted at near-record levels. On the southwestern coast, Nuuk, the capital, reported temperatures in the high 50Fs, about 10 degrees higher than average for this time of year.

The warmth increased the surface melting of Greenland's vast ice sheet, which covers about 80% of the island. Analysis of satellite data by the National Snow and Ice Data Center in Boulder, Colo., showed that melting extended across 380,000 square miles, or about 60% of the total ice area. But while the extent of melting has been higher than average this year—including a day in June that set an early-season record—it is less than the record 2012 melt season, when warm temperatures persisted for much of the summer and at one point nearly 100% of the ice sheet was melting.

Greenland's ice sheet is nearly two miles thick in places, and if as some fear we have passed the tipping point and all of it were to melt, global sea levels will rise about 24 feet. Melting has increased in recent decades because of climate change and has been outstripping accumulation from snow, resulting in a net loss of ice. Estimates vary, but a 2018 study found that the ice sheet has been losing an average of nearly 300 billion tons of ice per year this decade, contributing a total of about one-quarter of an inch to global sea level rise over that time.

The hottest summers in Europe in the past 500 years have all come in the past 17 years. Several heat waves have been linked to human-caused climate change. In the years ahead, many more are likely to scorch temperate zones like northern Europe.

Nicky Maxey, a spokeswoman for the weather service, said, "Heat waves are extreme weather events, but research shows that with climate change, they are likely to become more common, perhaps occurring as regularly as every other year."

She said that a Met Office study into the heat wave that Britain experienced last summer showed it was 30 times more likely for a heat wave to occur now than in 1750 "because of the higher concentration of carbon dioxide in the atmosphere."

The French authorities had issued hundreds of warnings to avoid the devastating death toll the country suffered during the 2003 heat wave, which contributed to almost 15,000 deaths.

In Myanmar, thirty inches of water flooded much of Mon State in early August. At least 50 people were killed, dozens are missing, over 105,000 have been displaced and mudslides buried nearly 30 houses. The effects of heavier than normal rains were exacerbated by heavy deforestation for mines and plantations and timbering operations which destabilized mountain-sides.

Climate Change Threatens the World's Food Supply

A recent United Nations report states that the world's land and water resources are being exploited at "unprecedented rates." Combined with climate change there is a very real question as to whether humanity will be able to feed itself. The report was released in early August by the Intergovernmental Panel on Climate Change, an international group of scientists convened by the UN that gathers and summarizes a wide range of existing research to help governments understand climate change and make policy decisions. This report was prepared by more than 100 experts from 52 countries and states that the window to address the threat is rapidly closing. A half-billion people already live in places turning into desert, and soil is being lost between 10 and 100 times faster than it is forming.

Climate change is making these threats worse, as floods, drought, storms and other types of extreme weather threaten to disrupt, and over time shrink, the global food supply. Already, more than 10% of the world's population is undernourished, and food shortages lead to an increase in cross-border migration and refugees.

The heightening danger is that food crises could develop on several continents at once. Food shortages are likely to affect poorer parts of the world far more than richer ones. That could increase a flow of immigration that is already redefining politics in North America, Europe and other parts of the world.

Between 2010 and 2015 the number of migrants from El Salvador, Guatemala and Honduras moving to the US border with Mexico increased fivefold, coinciding with a dry period that left many with insufficient food and was so unusual that scientists attribute it to climate change.

The report predicts that climate change will accelerate the danger of severe food shortages. As a warming atmosphere intensifies the world's droughts, flooding, heat waves, wildfires and other weather patterns, it is speeding up the rate of soil loss and land degradation. Higher concentrations of carbon dioxide in the atmosphere—a GHG put there mainly by the burning of fossil fuels—will also reduce food's nutritional quality, even as rising temperatures cut crop yields and harm livestock.

It is unlikely that the agriculture industry can adapt to these rapid changes. In fact, climate change is already hurting the availability of food due to decreased yields and lost land from erosion, desertification and rising seas, among other things. Food costs are also rising and will continue to do so which causes stress and rioting.

"[We're] reaching a breaking point with land itself and its ability to grow food and sustain us," said Aditi Sen, a senior policy adviser on climate change at Oxfam America, an antipoverty advocacy organization.

The report said that agricultural activities are contributing to climate change. For example, draining wetlands in Indonesia and Malaysia to create palm oil plantations is particularly damaging. When drained, peatlands, which store between 530 and 694 billion tons of carbon dioxide globally, release it back into the atmosphere. Every 2.5 acres of drained peatlands release the carbon dioxide equivalent of burning 6,000 gallons of gasoline.

The emission of carbon dioxide continues long after the peatlands are drained. Of the five gigatons of GHG emissions that are released each year from deforestation and other land-use changes, "One gigaton comes from the ongoing degradation of peatlands that are already drained," said Tim Searchinger, a senior fellow at the World Resources Institute, an environmental think tank. (By comparison, the fossil fuel industry emitted about

37 gigatons of carbon dioxide last year, according to the Institute.)

Cattle are significant producers of methane and an increase in global demand for beef and other meats has increased their numbers and promotes deforestation in critical forest systems like the Amazon.

Since 1961 methane emissions from ruminant livestock, which includes cows as well as sheep, buffalo and goats, have significantly increased, according to the report. And each year, the amount of forested land that is cleared—often for pasture for cattle—releases the emissions equivalent of driving 600 million cars.

Planting as many trees as possible would reduce the amount of greenhouse gases in the atmosphere by about nine gigatons each year, according to Pamela McElwee, a professor of human ecology at Rutgers University and one of the report's lead authors. But it would also increase food prices as much as 80% by 2050.

"We cannot plant trees to get ourselves out of the problem that we're in," Dr. McElwee said. "The trade-offs that would keep us below 1.5 degrees, we're not talking about them. We're not ready to confront them yet."

Preventing global temperatures from rising more than 1.5 degrees Celsius is likely to require both the widespread planting of trees as well as "substantial" bioenergy to help reduce the use of fossil fuels, the report finds. And if temperatures increase more than that, the pressure on food production will increase as well, creating a vicious circle.

"Above 2 degrees of global warming there could be an increase of 100 million or more of the population at risk of hunger," Edouard Davin, a researcher at ETH Zurich and an author of the report, said. "We need to act quickly."

The report said that the longer policymakers wait, the harder it will be to prevent a global crisis. "Acting now may avert or reduce risks and losses, and generate benefits to society," the authors wrote. Waiting to cut emissions, on the other hand, risks "irreversible loss in land ecosystem functions and services required for food, health, habitable settlements and production."

A Quarter of Humanity Faces Looming Water Crises

Seventeen countries, including parts of India, Iran and Botswana, are currently under extremely high water stress, meaning they are using almost all the water they have, according to new World Resources Institute data published in early August. Large cities have faced acute shortages recently, including São Paulo, Brazil; Chennai, India; and Cape Town, which in 2018 faced Day Zero—the day when all its dams would be dry.

Climate change heightens the risk. As rainfall becomes more erratic, the water supply becomes less reliable. As the days grow hotter, more water evaporates from reservoirs just as demand for water increases. Mexico's capital, Mexico City, is drawing groundwater so fast that the city is literally sinking. Dhaka, Bangladesh, relies so heavily on its groundwater for both its residents and its water-intense garment factories that it draws water from aquifers hundreds of feet deep. Chennai's residents, accustomed to relying on groundwater for years, are now finding there's none left. Across India and Pakistan, farmers are draining aquifers to grow water-intensive crops like cotton and rice.

WRI data shows that among cities with more than 3 million people, 33 of them, with a combined population of over 255 million, face extremely high water stress, with repercussions for public health and social unrest. By 2030, the number of cities in the extremely high stress category may rise to 45 and include 470 million people.

After a three-year drought, Cape Town in 2018 was forced to take extraordinary measures to ration what little it had left in its reservoirs. That acute crisis magnified a chronic conflict with Cape Town's 4 million residents competing with farmers for limited water.

For Bangalore, years of paltry rains revealed the city's mismanagement of its water. The many lakes that once dotted the city and its surrounding areas have either been built-over or filled with the city's waste. They can no longer store rainwater. And so the city ventures further away for water for its 8.4 million residents, and much of it is wasted along the way.

New York Awards Offshore Wind Contracts in Bid to Reduce Emissions

As noted in Blog 23, New York state last month passed an ambitious law to reduce the emissions that cause climate change. In July it reached an agreement for two wind farm projects, which will be the country's largest. They will be built off the coast of Long Island and should start operation within the next five years. One of the projects will be 14 miles south of Jones Beach and the other will be 30 miles north of Montauk. They are meant to be an important part of the state's plan to get 70% of its electricity from renewable sources by 2030. The projects will be built by a division of Equinor, the Norwegian oil and gas company, and a joint venture between Orsted, a Danish company, and Eversource Energy, an American firm.

Offshore wind farms have increasingly become mainstream energy sources in Northern Europe. They supply some of the cheapest electricity in Britain and Germany. Offshore wind's share of annual electricity generation in Britain increased to more than 6% in 2017, from less than 1% in 2010. By 2020, it may reach 10%.

Wind farms in the U.S. provided about 7% of all electricity last year, up from about 2% in 2010. Almost all of those turbines are on land. Interest in offshore wind has grown in recent years as fears of climate change have mounted and technological advancements have reduced the cost of power from offshore turbines. Developers have also figured out ways to put turbines in deeper waters so that they are not visible from shore.

There are currently five commercial wind turbines in American waters, near Block Island, R.I. Several other projects are in development, including a small one under construction in Virginia by Dominion Energy. New Jersey last month selected Orsted to build a 1,100-megawatt wind farm off the coast of Atlantic City.

"Interest in offshore wind has grown in recent years as fears of climate change have mounted and technological advancements have reduced the cost of power from offshore turbines. "

But some other projects, like Vineyard Wind's plans for turbines near Martha's Vineyard, have been delayed by federal and local officials.

The New York wind projects must still clear permitting and environmental hurdles. And the cost of the project will not be disclosed until after the agreements have been signed.

The state has set ambitious targets for renewable energy, but it received less than 5% of its electricity from wind and solar last year, according to the Energy Information Administration. New York faces numerous hurdles in increasing the use of renewable energy. In addition to finding space for more wind turbines and solar farms, it has to build more transmission lines—projects that invariably draw opposition from residents and others.

Washington

Ethics

The EPA's Inspector General will investigate allegations that William L. Wehrum, the agency's former air quality chief, violated ethics rules when he met with former clients from his days as a lawyer and lobbyist for the oil, gas and coal industries.

The inquiry will look into whether Mr. Wehrum's efforts at the EPA to weaken climate change and air pollution standards improperly benefited those former clients.

At issue are Mr. Wehrum's ties to the Utility Air Regulatory Group, a coalition of utilities and trade groups that lobbies on behalf of coal-fired power plants, which he represented as a lawyer at his former firm, Hunton & Williams.

Last year Politico reported that the 25 power companies and six trade groups that make up the coalition paid the firm more than $8 million in 2017 just before Trump appointed Mr. Wehrum. (The law firm is now known as Hunton Andrews Kurth. The Utility Air Regulatory Group announced its intention to disband.)

Mr. Wehrum resigned after helping to finalize a regulation relaxing restrictions the Obama administration had sought to impose on GHG emissions from coal-fired power plants. As the agency's assistant administrator for air and radiation, he was the legal expert behind other rollbacks of key climate change and air pollution regulations, including weakening Obama-era regulations on GHG emissions from automobiles and methane from oil and gas wells. (A coalition of 22 states and 7 cities in mid-August sued to block the rollback.)

The House Energy and Commerce Committee opened an inquiry into whether Mr. Wehrum and David Harlow—a senior counsel at the EPA who worked with Mr. Wehrum at the law firm—improperly worked to reverse an enforcement action against a former client, DTE Energy.

Senator Tom Carper of Delaware, the top Democrat on the Senate Environment and Public Works Committee, and Senator Sheldon Whitehouse, a Rhode Island Democrat, sent an investigative report to the EPA Inspector General that outlined allegations about both Mr. Wehrum and Mr. Harlow. Those included accusations that Mr. Wehrum's recusal statements did not disclose some meetings with former clients.

Michael Abboud, issued a statement from EPA disputing the facts in the Senate Democrats' report and described it as "a replay of old allegations that have repeatedly been answered by the agency and Mr. Wehrum."

Under ethics rules developed under both the Obama and Trump administrations, public officials are not permitted to take part in "particular matters" involving specific parties that they represented in the private sector.

Automakers

Four of the world's largest automakers reached a deal with California to reduce tailpipe pollution, in a setback to the Trump administration as it prepares to weaken national emissions standards and revoke states' rights to set their own such rules.

While Trump administration officials in the White House and EPA have been working to weaken Obama-era rules on planet-warming vehicle emissions, four automakers—Ford, Honda, Volkswagen Group of America and BMW of North America—held secretive talks in Sac-

ramento on a plan to move forward with the standards in California, the nation's largest auto market. Gavin Newsom, the governor of California said he was "very confident" that more automakers would join the deal.

The move is another blow in the battle between Mr. Trump and California, a state which has filed more than 50 lawsuits against his administration. "We in California see these regulations as a good thing. The Trump administration is hellbent on rolling them back," Mr. Newsom said. "They are in complete denialism about climate change."

Spokesmen for the White House and the EPA did not comment on the deal.

Environmental policy experts called it a powerful pushback against Trump's efforts to unwind one of the central policies of the Obama administration to fight climate change. "I think this is a breakthrough," said Daniel Lashof, the US director of the World Resources Institute. "This shows that state leadership is indispensable. That's where the leadership is coming from right now in the US on climate."

The EPA and Transportation Department are expected to announce this summer a plan that would effectively eliminate the Obama-era rule, which requires passenger vehicles to achieve an average mileage of about 52.5 miles per gallon by 2025. That rule would have significantly lowered vehicle emissions of planet-warming GHG pollution. Instead, the new standard will be about 51 miles per gallon by 2026.

The new Trump rule is expected to lower that standard to about 37 mpg. It is also expected to revoke the legal authority of California and other states to set their own, stricter, state-level standards.

In a joint statement, the four automakers said the agreement with California would lead to "much-needed regulatory certainty." The deal would let them "meet both federal and state requirements with a single national fleet, avoiding a patchwork of regulations while continuing to ensure meaningful greenhouse gas emissions reductions."

Trump has promoted his plan to roll back federal vehicle pollution standards as a gift to the auto industry. But automakers have said it could actually harm them by creating regulatory uncertainty as California and other states claimed the legal right to set their own standards and fought back in the courts.

Thirteen other states already follow the California pollution standards, and are expected to fight in court if the Trump administration revokes their right to do so. Automakers fear that a mix of state and federal pollution standards could split the U.S. auto market, forcing them to make and sell entirely different types of vehicles in different states.

Last month, 17 automakers sent a letter to Mr. Trump telling him that his plan to weaken tailpipe pollution standards threatened to cut their profits and produce "untenable" instability in a crucial manufacturing sector.

In response, a White House spokesman blamed California, saying it "failed to put forward a productive alternative."

After that letter, several auto companies approached California officials asking if they could work out a separate deal. "It became clear very quickly that following up on that letter and the lack of response from the administration that they were ready to sit down with us," said Mary D. Nichols, California's top clean air official.

National Security

On July 30, 2019, Rod Schoonover published an opinion piece in the New York Times. He wrote that the White House blocked his report on Climate Change and National Security forcing him to quit his job as an intelligence analyst for the State Department.

His focus was on the impact of climate change on national security, a growing concern of the military and intelligence communities. For 10 years he enjoyed the apolitical nature of the work in the State Department's Bureau of Intelligence and Research.

But in June the White House blocked the submission of his bureau's written testimony on the national security implications of climate change to the House Permanent Select Committee on Intelligence. The stated reason was that the scientific foundation of the analysis did not comport with the administration's position on climate change.

Mr. Schoonover was permitted to give a five-minute verbal summary of the 11-page testimony. Congress was deprived of the full analysis, including the scientific baseline from which it was drawn. And this written testimony on this critical topic was never entered into the official record.

The bottom line was this: "Climate change will have wide-ranging implications for U.S. national security over the next 20 years." This assessment is based on peer-reviewed scientific studies and findings of the government's own scientists. This conclusion was not new. The intelligence community has repeatedly warned of the dangers that climate change poses to national security. Earlier this year, Dan Coats, then director of national intelligence, warned in the annual "Worldwide Threat Assessment" that, "Global environmental and ecological degradation, as well as climate change, are likely to fuel competition for resources, economic distress, and social discontent through 2019 and beyond."

As I have been chronicling in this Blog, decades of scientific measurements have established that global temperatures are rising and ocean waters are acidifying. As a result we are seeing changes in Earth system processes: in the atmosphere, ocean, freshwater, soil, ice masses, permafrost and organisms comprising the biosphere. Some,

as Mr. Schoonover says, are well known, like increased frequency and intensity of heat waves and droughts and rising sea levels. Others are less familiar, like decreasing oceanic oxygen levels and the redistribution of species.

And consistent with the Life Pyramid I noted in Blog 1 (http://communities.nysba.org/blogs/carl-howard/2017/08/15/global-climate-change-blog-1-81517) where humanity balances atop the healthy and well-functioning oceans, land, stable climate and politics, Mr. Schoonover notes that the disruption to our basic Earth systems "combine with existing social and political conditions and can disrupt societies and nations. They harm people directly or degrade the social, political, economic, agricultural, ecological or infrastructural systems that support them."

He wrote that "we should expect disruptions to global water and food security, reduced economic security and weakened livelihoods, worsened human and animal health, and risks to the global supply chain on which the United States and its partners depend. Political instability, heightened tensions over resources, climate-linked humanitarian crises and adverse effects to militaries in some places are likely to increase. Migration will probably increase both within and between nations, with sociopolitical and resource implications already becoming clear."

As I've said, we could not be more effectively and systematically undermining the Life Pyramid if we tried.

After the administration changed in 2017, Mr. Schroonover saw his job as even more important because of the skepticism within the Trump administrative over climate change. The intelligence community tries to deliver objective truth to decision makers regardless of who occupies the White House. But the Trump administration "decision to block the written testimony is another example of a well-established pattern in this administration of undercutting evidence that contradicts its policy positions." "When a White House can shape or suppress intelligence analysis that it deems out of line with its political messaging, then the intelligence community has no true analytic independence. I believe such acts weaken our nation." And threaten the planet.

Facts on the Ground; Environmental Refugees: Washington, D.C.; Albany, N.Y.

By Carl Howard

Facts on the Ground

Environmental injustice is an important part of discussions involving climate change. The fact is that those least culpable for the existence of climate change suffer disproportionately from it. Dorian, a Category 5 hurricane destroyed much of the Bahamas over two deadly, terrifying days.

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When Dorian made land-fall on the Bahamas, its winds were a sustained 185 mph gusting to 220 mph, making it the strongest Atlantic hurricane ever recorded on land. At least 51 people were killed. Over 2,500 people have been reported missing. All survivors are traumatized. Many will suffer PTSD. None can imagine a future on the island. Who will lend them money to re-build? Many have tried to leave only to be denied access to the U.S. for lack of a visa.

Given the fact that the waters of the world's oceans are only gong to get warmer, and the amount of water vapor in the atmosphere is only going to increase, such storms are expected to be the norm during future hurricane seasons. Such storms could hit just about anywhere on the eastern coast of the U.S., including New York City. It's unimaginable what the Bahamians just suffered through.

Flooding is another of the catastrophic effects of climate change. Fifteen mid-western states suffered months of destructive and deadly flooding during the first half of 2019. An interconnected catastrophe unfolded along the Missouri, Mississippi and Arkansas Rivers, a system that drains more than 40% of the U.S. North Dakota, Minnesota, Wisconsin, South Dakota, Iowa, Nebraska, Illinois, Kansas, Missouri, Tennessee, Arkansas, Oklahoma, Louisiana, Texas and Mississippi all had major flood stages and all had federal assistance in over 400 counties.

Bryan Tuma, assistant director of Nebraska's Emergency Management Agency, said, "I would describe it as biblical."

The year through May 2019 was the wettest 12-month period on record in the U.S., according to the National Oceanic and Atmospheric Administration. Nearly 38 inches of water fell, almost eight inches above average.

A Mississippi River mayors council estimated that the cost of infrastructure damage and emergency response alone was at least $2 billion. That number will rise as the water recedes and the extent of the damage can be assessed. The full cost to repair homes and businesses has yet to be calculated. Hundreds of homes were flooded, 100s of 1,000s of acres of farmland was flooded. In Cairo, Ill., water was above flood stage for a record 156 consecu-

tive days. In Arkansas, nearly 40% of the soybean crop could not be planted.

David Alexander, a professor of risk and disaster reduction at University College London, said that typical recovery times from such major disasters are "in the range of 10 to 25 years."

The flood-waters of the Mississippi carried chemical fertilizers from upstream farms, lawns and other sources which produced a "dead zone" in the Gulf of Mexico, an area with too little oxygen to support fish and other marine life. NOAA predicts that it will cover 8,717 square miles—about the size of New Hampshire.

As I write, Houston and the surrounding areas have again been flooded two years after Hurricane Harvey. Tropical Storm Imelda dropped 43" of rain in three days in the areas between Winnie and Beaumont, east of Houston. Two people are known to have drowned and 1,000s were rescued from their homes and stranded vehicles. Texas Gov. Greg Abbott declared a state of disaster for 13 counties.

Wildfire is another of the catastrophic effects of climate change. Fires burned unprecedented amounts of forests releasing immense amounts of carbon. Out of control fires burned Amazonian forests in Brazil and Bolivia, fires also burned in Central Africa, Southern Africa as well as Alaska, Greenland and Siberia.

The Amazonian and Southern Africa forest fires are doubly destructive as they both destroy carbon sinks (which absorb carbon) and release carbon to the atmosphere. Angola had the most fire alerts by province while Brazil ranked second, with Zambia and the Democratic Republic of Congo third and fourth respectively. The Democratic Republic of Congo has more than its usual number of fires for the year. This area is of great concern as its forests are considered the planet's "second lungs" after Brazil's.

Climate change is contributing to the increase in forest fires. Rising temperatures, altered weather patterns resulting in less rain and industrial practices like logging have made forests increasingly vulnerable to out-of-control blazes. Less rain leaves the land dry and more vulner-

able to sparks, while logging thins the forest, making it less dense and less humid, and more vulnerable to fire. Illegal logging by farmers clearing land set intentional fires which often get out of hand.

At the Group of 7 summit of political leaders this summer, amid a global feud over how to handle the Brazil blazes, President Macron of France said he was considering an aid program to help. Indeed, several of the G7 nations pledged more than $22 million to fight the fires in the Amazon but it was angrily rejected by Brazilian President Jair Bolsonaro of Brazil who has favored development of the Amazon as the right of Brazilians. Brazil has strict environmental laws and regulations, but they are often violated with impunity. The vast majority of fines for breaking environmental laws go unpaid with little or no consequences.

As a result, illegal logging and the intentional setting of fires in Brazil has produced more than 74,000 wildfires this year, an 84% increase from the same period last year. About 4.6 million acres have burned so far in Brazil, a 62% increase over 2018.

The European Parliament is considering a trade deal between the European Union and Brazil, Argentina, Paraguay and Uruguay, but environmentalists are pressing lawmakers to address Brazil's fires first. Police in London arrested six activists from the Extinction Rebellion group who glued themselves to the windows of the Brazilian Embassy.

Just as U.S. federal workers are voicing displeasure with the anti-environmental policies of Trump, so too are federal Brazilian workers in revolt. Hundreds of government workers who enforce Brazil's environmental laws signed an open letter warning that their work has been hampered by President Bolsonaro, contributing to a rise in deforestation and the fires sweeping through the Amazon.

Employees of the country's main environmental agency, Ibama, said that their mission had been hobbled in recent years as a result of budget cuts, 44% staff reductions over the past decade, including in remote areas, political interference and a weakening of environmental regulations. Leaders of two employee associations described a demoralized, beleaguered work force that had been contending for years with budget cuts and a rise in illegal mining.

"There is no way to separate those factors and the significant rise in deforestation and fires," they wrote in the letter.

Since Mr. Bolsonaro took office in January, deforestation has increased at a significant rate and Ibama has carried out fewer enforcement actions, which include issuing fines and warnings and conducting worksite raids. Like Trump, Mr. Bolsonaro has long supported scaling back environmental protections.

This year's burnings are likely to worsen in part because the U.S. trade war with China—one of the world's biggest soybean buyers—has driven Beijing to find new suppliers to replace American farmers. Brazil has happily stepped in.

Fires burned at a historic pace in the Arctic regions of Siberia too. This year has seen a dramatic increase in wildfires in some arctic regions that traditionally rarely burned. Since July, fire has covered six million acres of Siberian forest, an area roughly the size of Vermont. In Alaska, fires have consumed more than 2.5 million acres of tundra and snow forest, leading researchers to suggest that the combination of climate change and wildfires could permanently alter the region's forests and ecology.

Over the first 18 days of August alone, Arctic wildfires emitted 42 megatons of carbon dioxide. That brought the total for June, July, and the first part of August to more than 180 megatons, roughly three and a half times more than Sweden emits in a year.

The Arctic is warming twice as fast as the rest of the planet, and some studies have noted that, as it warms, there also is expected to be more lightning. Lightning is a significant cause of fires.

Some researchers warn that as fires strike places where they were previously rare, it threatens to contribute to a feedback loop in which wildfires potentially accelerate climate change by adding significant amounts of carbon dioxide to the atmosphere.

And though the Amazon is widely understood to produce oxygen while absorbing carbon dioxide, Siberian forests are as important to the global climate system as tropical rainforests.

One reason that arctic wildfires are particularly concerning is that in addition to trees and grassland burning, peat also burns, a dirt-like material in the ground that releases much more carbon dioxide when it burns than do trees per acre of fire. In the past, peat fires in northern climates were rare because of moisture that is now disappearing as the region becomes warmer and drier.

Similarly, in Southeast Asia, 71% of peat forests have been lost across Sumatra, Borneo and peninsular Malaysia between 1990 and 2015. In many cases the forests were replaced by farms that produce palm oil, which is used in everything from cookies to cologne and is one of the most important crops in the region.

Not only are the fires widely seen as a signal of climate change, but they can also exacerbate global warming because of the soot produced by burning peat, which is rich in carbon. When the black soot settles on nearby glaciers, it causes the ice to absorb the sun's energy instead of reflecting it, speeding up the melting of the glacier.

Environmental Refugees

The catastrophic effects of climate change, such as those noted above, lead to environmental injustice such as death and destruction of homes and lives and forced migration mostly in developing nations. During the first half of 2019, a record 7 million people were displaced by extreme weather according to The Internal Displacement Monitoring Center.

"In today's changing climate, mass displacement triggered by extreme weather events is becoming the norm," the center said in its report, adding that the numbers represent "the highest midyear figure ever reported for displacements associated with disasters."

The latest numbers reflect both bad news and good. Extreme weather events are becoming more extreme in the era of climate change, according to scientists, and more people are exposed to them, especially in rapidly growing and storm-prone Asian cities.

But, many governmental bodies have become better prepared for extreme weather, with early warning systems and evacuation shelters in place that prevent mass casualties.

Thus, the number of refugees this year include many who might otherwise have been casualties. That was almost certainly the case for the 3.4 million people who were evacuated from their homes in India and Bangladesh in May before Cyclone Fani barreled over the Bay of Bengal. Fewer than a hundred fatalities were reported from both countries, according to the United Nations humanitarian affairs agency.

By contrast, in southern Africa, where Cyclone Idai struck in March, more than 1,000 people were killed and 617,000 were displaced across Mozambique, Malawi, Zimbabwe and Madagascar.

In March and April, half a million Iranians were forced from their homes and camped in temporary shelters after a huge swath of the country endured the worst flooding in decades. And in Bolivia, heavy rains triggered floods and landslides in the first four months of the year, forcing more than 70,000 people to flee their homes, according to the report. All told, nearly twice as many people were displaced by extreme weather events, mainly storms, as the numbers displaced by conflict and violence in the first six months of this year, according to the monitoring center.

The numbers hold lessons for countries, especially those like the Caribbean island nations, repeatedly pummeled by intensifying storms.

Washington

The Trump administration announced its intention to sharply curtail the regulation of methane emissions. Methane is a major contributor to climate change with perhaps 80 times the heating-trapping power of CO2 in the first 20 years in the atmosphere.

The EPA, in a proposed rule, aims to eliminate federal requirements that the oil and gas industry use technology to inspect for and repair methane leaks from wells, pipelines and storage facilities.

The proposal is notable because major oil and gas companies have opposed it (Exxon, Shell, BP America), just as some other industries have opposed the Trump administration's other major moves to dismantle rules to address climate change and other environmental rules put in place by President Obama. For example, some of the world's largest auto companies have opposed Trump's plans to allow more vehicle pollution, and some electric utilities have opposed the relaxation of restrictions on toxic mercury pollution from coal-fired power plants.

"This is extraordinarily harmful," Rachel Kyte, the United Nations special representative on sustainable energy, said of this and other Trump administration efforts to undo climate regulations. "Just at a time when the federal government's job should be to help localities and states move faster toward cleaner energy and a cleaner economy, just at that moment when speed and scale is what's at stake, the government is walking off the field."

The proposed rule must go through a period of public comment and review. The earliest it could be finalized is early next year.

The Trump administration also announced new rules to roll back requirements for energy-saving light bulbs, which will contribute to increased GHG emissions as well.

The Energy Department's filing in the Federal Register will prevent new efficiency standards from going into effect on Jan. 1 under a law passed in 2007 during the administration of President George W. Bush. The new changes are likely to be challenged in court.

The gradual shift toward more efficient light bulbs is one of the largely unsung success stories in the fight to reduce energy use and GHG emissions. "U.S. household energy consumption is down 6% since 2010, and this is due in part to the increase in the use of energy-efficient lighting," said Lucas Davis, a professor at the Haas School of Business, University of California, Berkeley.

One part of the new standards would have required the adding of four kinds of incandescent and halogen light bulbs to the energy-efficient group. The new rule will eliminate the requirement for those four categories of bulbs. The Department of Energy was also supposed to begin a broader upgrade concerning energy efficiency in pear-shaped bulbs, scheduled to go into effect Jan. 1, 2020. The DOE is proposing a new rule that eliminates this requirement too.

Some consumers disapprove of the light quality and durability of compact fluorescent bulbs, but LED bulbs have a richer light spectrum, last for many years and have sold well. Companies that manufacture light bulbs have resisted the regulatory shift requiring more efficiency.

The trade association for companies that make light bulbs supported DOE's proposal. But Noah Horowitz, director of the Center for Energy Efficiency Standards at the Natural Resources Defense Council, said regulation was necessary. "Energy-wasting incandescents and halogens still make up more than a third of new bulb sales. We need standards to ensure every new bulb sold is an efficient one."

His group estimates that using efficient bulbs in all six billion light sockets in the U.S. could produce $14 billion in savings in 2025, "equivalent to the electricity generated by 25 large power plants."

Trump is also moving forward with his plan to revoke California's legal authority to set state tailpipe pollution standards that are stricter than federal regulations. Trump had originally sought to affect a more sweeping rollback of Obama-era rules designed to cut the emissions of planet-warming greenhouse gases via weakening federal fuel economy standards. But he appears to have abandoned that effort as staff members have been unable to prepare adequate legal, technical, economic and scientific justifications for it.

In addition, four major automakers (Ford Motor Company, Volkswagen of America, Honda and BMW) signed a deal in July with California agreeing to abide by the state's stricter standards if the national rollback goes through. The four automakers agreed to standards slightly less stringent than the Obama-era rules but requiring them to significantly improve the fuel economy of their vehicles.

In response, Trump's Justice Department opened an antitrust inquiry. Trump appears to be pushing these efforts so that any legal challenges reach the Supreme Court before the end his first term.

California's right to set its own tailpipe pollution rules dates to the 1970 Clean Air Act. The law granted California a waiver to keep its stricter standards which pre-dated the federal statute. A revocation of the California waiver would have national significance as thirteen states follow California's tighter standards, together representing roughly a third of the national auto market.

Thus, the fight over federal auto emissions rules could split the U.S. auto market, with some states adhering to stricter pollution standards than others. For automakers, that would be an unacceptable scenario.

The Obama-era tailpipe pollution rules that the administration hopes to weaken would require automakers to build vehicles that achieve an average fuel economy of 54.5 miles per gallon by 2025, cutting about six billion tons of carbon dioxide pollution over the lifetimes of those vehicles. The proposed Trump rule would lower the requirement to about 37 mpg, allowing for most of that pollution to be emitted.

Xavier Becerra, the California attorney general, restated his intention to sue over any attempt to undermine his state's legal authority to set its own pollution standards. "California will continue its advance toward a cleaner future," he wrote in an email.

A spokeswoman for the American Auto Alliance, which lobbies on behalf of the largest automakers, declined to comment until any plan had been made public.

Albany, N.Y.

Our Section has asked DEC Commissioner Seggos and NYSERDA President Alicia Barton to add our colleague Mike Gerrard to the NYS Climate Action Council of which they are co-chairs. The Council was created pursuant to the Climate Leadership and Community Protection Act recently signed by the Governor. Mike's latest book, Pathways to Deep Decarbonization in the United States literally guides the way to a scoping plan required of the Council by the Act. We urge you to support Mike's appointment to this position.

Facts on the Ground; New Report Finds World's Oceans in Danger; Legal Rulings: Trump's EPA Can't Erase Interstate Smog Rules; Good News; Washington

By Carl Howard

Facts on the Ground

I had just written that hurricane (usually a violent storm over water) season is over so now it's wildfire season in the U.S., but then a tornado (usually a violent storm over land) tore into Dallas, Texas. The tornado caused panic at the Memphis airport and at least one death in Arkansas and destruction in Missouri and Tennessee. Passengers at Memphis International Airport were pulled off planes and directed to take shelter in terminal restrooms. In Dallas, the tornado brought golf-ball-size hail and lightning. About 85,000 people in the Dallas-Fort Worth region lost power.

In California, given the persistent drought and a forecast for high winds, Pacific Gas & Electric, the largest utility in the state, cut power to 500,000 customers as a precaution against sparking another fire. The outages extended from the edge of Silicon Valley to the foothills of the Sierra Mountains and affected 800,000 customers. The company was responsible for dozens of wildfires in recent years, including the state's deadliest which destroyed the town of Paradise last November that killed 86 people. PG&E filed for bankruptcy in January facing tens of billions of dollars in wildfire liabilities. Thirty-four out of 58 counties in CA were affected by the power cut.

Police were dispatched to direct traffic and patrol against break-ins. Schools and businesses have shut down. The economic impact will be significant.

Climate change has led to changes in the jet stream and ocean currents which has led to oddities such as the early October snow-storm in Montana. Governor Steve Bullock issued a state of emergency after an unusually intense storm dropped 48 inches of snow on some parts of the state.

Climate change has been blamed for numerous record-setting weather events in the Northern Hemisphere this year. Heatwaves across Europe and the Arctic made this the hottest summer on record, the midwestern U.S. is still recovering from terrible floods (see Blog 25), and this year's hurricane season was unusually intense.

Here in NYC, we experienced record-breaking high temperatures (93 F) on October 2, the hottest on this date since 1927 (when it reached 90). Both JFK and LaGuardia Airports hit 95 degrees, and it was 96 degrees in Newark.

In Hawaii, record heat has led to a "New Era" of coral bleaching. The death of these corals jeopardize an important source of protection from storm surge, revenue from tourism and food for the state's consumption and economy. The death of corals world-wide poses similar harms.

Because of climate change, the ocean has become too hot for too long. It's causing the corals to expel the symbiotic algae that lives inside them, which leaves their bony skeletons fragile and white. This is the third widespread coral bleaching in Hawaii since 2014. Bleaching events occurred in the 1990s and once in the 1980s, but it likely will become an annual event by 2040 unless carbon emissions globally are rapidly reduced. But corals may well be gone by then if they can't adopt fast enough to warmer, more acidic, seas.

The Intergovernmental Panel on Climate Change's special report on the oceans (see below) predicted that marine heatwaves will be 20 times more frequent even if the world's nations meet the pledges they made in the 2015 Paris accord to keep global warming well below 2 degrees Celsius above pre-industrial levels by 2100. Marine heatwaves could be 50 times more frequent if GHG emissions continue to increase. The bad news is that nations are falling short of the pledges they made to avert the most dire effects of climate change.

The U.S. is currently the world's second largest emitter of carbon dioxide but Trump still plans to pull the U.S. out of the accord as soon as possible, which is the day after the November 2020 election. Brazil's President Jair Bolsonaro has similar intentions.

But new commitments have been made at local levels. Hawaii has bound itself to the Paris agreement and half the country is now part of the U.S. Climate Alliance in which states agree to accelerate policies that reduce carbon pollution and promote clean energy deployment.

Houston has again suffered through several severe storms and despite its attempts to adapt to the threat of climate change after Hurricane Harvey in 2017, passing tougher building codes, offering buyouts for flood-prone homes and budgeting billions of dollars in new funding for flood control, its residents still were over-whelmed.

Tropical Storm Imelda flooded at least 1,700 homes in Houston and surrounding Harris County. The question now is, 'can a motivated vulnerable city make enough adaptations to survive?' "It's a race against time," said Lina Hidalgo, the top elected official in Harris County, who

talks about the pace of construction projects not in years, but in hurricane seasons. "We're being battered."

Imelda hit parts of the county with two and a half feet of rain, killed five people and caused an estimated $8 billion in damage across the region. The storm, which struck two years and two weeks after Harvey, means Harris County has now suffered one 500-year rainfall event and two 100-year events since 2016.

Yet another storm (Lorenzo) broke records, not because it was a Category 5, but because it occurred in a place no climatologist ever expected to see it: the mid-Atlantic, about 1,420 miles southwest of the Azores, an archipelago of volcanic islands and home to about 250,000 people. No Category 5 storm had ever been recorded that far north and east in the Atlantic. Residents were warned to expect waves more than 70 feet high.

"This is something totally unusual for this kind of environment," said Miguel Miranda, the president of the Portuguese Institute of the Sea and Atmosphere. "Most of the infrastructure is not really prepared for this kind of situation."

Returning to the horror of fires, 3,300 wildfires burned across Indonesia in September, turning the sky blood red over central Sumatra and creating dense clouds of smoke that have caused respiratory problems for nearly a million people.

Dense white smoke filled the air across Sumatra and Indonesian Borneo, known as Kalimantan, the two areas that were hardest hit. Many of the fires were set deliberately to clear land for plantations that produce palm oil and wood pulp for making paper.

The blazes occurred in sensitive rain forests where dozens of endangered species live, and have drawn comparisons to the wildfires in the Amazon basin that destroyed more than 2 million acres. Officials estimate that the fires burned more than 800,000 acres in Kalimantan. The smoke and flames threaten three species of endangered orangutans that are found only on Sumatra and Borneo.

New Report Finds World's Oceans in Danger

Occasionally I refer to the Life Pyramid mentioned in Blog 1. Humanity is perched atop supporting blocks including resources derived from Land, and resources derived from Water/Oceans (as well as Climate and Political Stability). I have been writing about disruptions to the land in recent Blogs (flooding, fires, etc.). Now I'll address a major new United Nations report issued by the IPCC which warns that the oceans are under severe strain from climate change, threatening our ability to harvest seafood and the well-being of hundreds of millions of people living on the coasts.

Fish populations are declining due to rising water temperatures, and oxygen levels are declining while acidity levels rise, posing risks to key marine ecosystems. Warmer seas, combined with rising sea levels, has produced ever more powerful tropical cyclones and floods, the report said, further endangering coastal regions.

"The oceans are sending us so many warning signals that we need to get emissions under control," said Hans-Otto Pörtner, a marine biologist at the Alfred Wegener Institute in Germany and a lead author of the report. "Ecosystems are changing, food webs are changing, fish stocks are changing, and this turmoil is affecting humans."

For decades, the oceans have protected us from global warming, absorbing about 25% of the carbon dioxide that humans emit from power plants, factories and cars, and absorbing more than 90% of the excess heat trapped on Earth by carbon dioxide and other greenhouse gases. Without that protection, the land would be heating much more rapidly.

But the oceans themselves are becoming hotter and less oxygen-rich as a result, according to the report. If humans keep pumping greenhouse gases into the atmosphere at an increasing rate, the risks to human food security and coastal communities will increase sharply, particularly since marine ecosystems are already facing threats from plastic pollution, unsustainable fishing practices and other man-made stresses.

"We are an ocean world, run and regulated by a single ocean, and we are pushing that life support system to its very limits through heating, deoxygenation and acidification," said Dan Laffoley of the International Union for Conservation of Nature.

The report, which was written by more than 100 international experts and is based on more than 7,000 studies, represents the most extensive look to date at the inter-related effects of climate change on oceans, ice sheets, mountain snowpack and permafrost.

For instance, as ice sheets atop Greenland and Antarctica melt and raise ocean levels, the report said, previously rare extreme flooding could start occurring once a year or more, on average, in many coastal regions this century. How soon this occurs is dependent on how quickly humanity reduces GHG emissions.

Globally, glaciers are fast receding, affecting the availability of water for millions of people who depend on meltwater for drinking, irrigation and production of electricity through dams and hydropower.

Perhaps most alarming is the report's description of major oceanic shifts that are already occuring. Three examples: the doubling in frequency since the 1980s of marine heat waves which kill fish, seabirds, coral reefs and seagrasses; the changed migration of numerous fish populations far from their usual locations to find cooler waters, which disrupts local fishing industries; and, the

decline in floating sea ice in the Arctic Ocean at rates that are likely unprecedented for at least 1,000 years.

The havoc caused by heat waves in coastal communities is being felt in the North Pacific Ocean, where a "blob" of unusually hot water in 2013 and 2014, partly fueled by global warming, killed thousands of seabirds and helped spawn toxic algae blooms that closed fisheries from California to British Columbia. And now, the blob is back.

The blob in '14-15 was about 8 to 10 times the size of Alaska. And the current blob is comparable. Researchers think that climate change strongly influences the blob's creation.

"Parts of Hawaii saw about 50% coral loss for the 2015 event," according to Jamison Gove, a research oceanographer with NOAA. "It was particularly devastating in areas off Hawaii Island and Maui." Reef watchers said they were worried about a repeat.

Entire fisheries collapsed along the Pacific during the previous heat wave as high water temperatures upended the aquatic food web. According to some estimates, 100 million cod disappeared off the coast of southern Alaska. Last year, officials in the Gulf of Alaska reduced permitted cod catches by 80% to allow stocks to rebuild in the wake of the heat wave, upsetting the local fishing industry.

"When that happens, it's like a punch in the gut," said Brett Veerhusen, a fisheries consultant and commercial fisherman. "And it's not just fishermen who are affected, it's an entire supply chain, from processing plants to shipping to grocery stores and restaurants."

The report notes that some pathogens are proliferating in warmer waters, including vibrio, a bacteria that infects oysters and other shellfish, and has sickened some 80,000 Americans who eat raw or undercooked seafood each year.

Warming waters can trigger the release of a neurotoxin called domoic acid from algae. Shellfish eat the algae and when animals eat the shellfish they get sick and can die. Tens of thousands of dead seabirds washed up on beaches during the 2014 blob, as did sick and dying sea lions. In 2016, domoic acid also prompted officials to close the California Dungeness crab fishery.

If fossil-fuel emissions continue to rise rapidly, the maximum sustainable harvest of ocean fish could decline by as much as 25% by century's end. Given that 17% of the world's animal protein comes from the ocean, and millions of people worldwide depend on fishing for their livelihoods, such a decline would be devastating.

The report recommends the obvious reduction of GHGs but is frank about the need to adapt to now unavoidable changes. Even if nations rapidly phase out the use of fossil fuels and limit global warming to below an increase of 2C from preindustrial levels, the world's oceans and frozen landscapes still will be drastically altered by the end of the century. Warm-water coral reefs face devastation. Global sea levels likely will rise another 1 to 2 feet this century as ice sheets and glaciers melt. Fish populations will continue to migrate into new markets (or crash), likely creating winners and losers among fishing nations and potentially leading to conflicts.

Because sea levels will continue to rise, the report notes that coastal cities will need to build costly sea walls and many people likely will need to move away from low-lying areas. To prevent seafood stocks from collapsing, fishery managers will need to halt unsustainable fishing practices.

Recognizing that despite decades of warnings and reports, global GHG emissions continue to rise, the report states that such adaptation measures may be ineffective. The worst-case emissions scenario with unchecked GHG emissions throughout the century may produce sea levels rising at a relentless pace for hundreds of years, potentially reaching 17 feet or higher by 2300.

"Our fate is probably somewhere in between" the best- and worst-case emissions scenarios laid out in the report, said Michael Oppenheimer, a climate scientist at Princeton University and a lead author of the report's chapter on sea levels. "But if you think about the possibility of indefinite or even accelerating sea level rise for centuries to come, that bodes very poorly for coastal civilization."

Legal Rulings: Trump's EPA Can't Erase Interstate Smog Rules

Out of more than 50 court rulings on agency policy under Trump, the government has lost 93%, according to tracking by the Institute for Policy Integrity at New York University School of Law. The two latest rulings concern interstate pollution. The first involved a Trump-appointed judge, Gregory Katsas, a deputy White House counsel before his appointment to the District of Columbia U.S. Circuit Court of Appeals in 2017. He was joined by Judges Judith Rogers and Thomas Griffith in finding that the administration's so-called "Close-Out Rule" was not permissible under the Clean Air Act. (Rogers was appointed by President Clinton, and Griffith by President George W. Bush.)

The ruling struck a 2018 Trump administration rule that had relieved states of their obligation to curb air pollution that causes smog in downwind states hundreds of miles away. EPA must now propose a new plan for addressing the nation's long-standing problems with ground-level ozone, or smog, to meet the requirements of the Clean Air Act. It's a task complicated by Trump's rolling back the restrictions on coal power plant pollution in the Clean Power Plan, the Obama administration's signature policy on climate change.

The EPA finalized the "Close-Out Rule" last year, ending a requirement that upwind states reduce smog-forming pollution from coal power plants. EPA concluded it was not feasible to implement cost-effective measures, and it projected that all states would soon be in compliance with federal ozone standards without further federal action.

New York, Connecticut and New Jersey sued, arguing that they each had areas with serious smog problems and would be unable to meet the federal ozone standard by the law's 2021 deadline because of pollution from other states. The appeals court panel agreed with them, ruling that the Clean Air Act's Good Neighbor Provision requires that upwind states eliminate significant contributions to other states' pollution problems without regard to feasibility.

The ruling is connected to a decision by the same court a few weeks earlier in a separate case, in which an Obama administration rule that would have partially addressed upwind pollution was thrown out on the same legal basis for not going far enough.

The court noted that the EPA had indicated it might seek rehearings before the full court of appeals on both cases. Given how little time remained for the downwind states to meet the 2021 ozone deadline, the court set an expedited schedule giving the Trump administration until Oct. 28 to file for rehearing.

The genesis of much of the smog that troubles cities is pollution from coal-fired power plants and industrial smokestacks many miles away, combined with emissions from traffic on urban roadways.

Although the Obama administration's cross-state pollution rule only partially addressed the upwind pollution problem, it projected that its Clean Power Plan would result in significant reductions of smog-forming pollutants.

As a side benefit of cutting carbon emissions from coal power plants, the Obama EPA projected smog-forming nitrogen oxides would fall 22% by 2030 compared to the status quo without the rule in place. The Trump administration expects nitrogen oxide emissions to fall by only 0.9% by 2030 compared to the status quo. The Obama and Trump administrations have wildly different projections on pollution trends. The Trump administration sees pollution falling so quickly without regulation that no further controls are necessary.

Without a strong climate policy to reduce coal power pollution in place, the Trump administration has fewer options for addressing smog. Federal officials may have to look to regulation of other industrial sources of pollution if they are to meet the requirements of the law as articulated by the court.

Earthjustice, one of the environmental groups that joined in the case, said the decision will benefit more than 36 million people in the Eastern United States and Texas who live in counties that have ozone levels exceeding the federal standard.

Good News

Pennsylvania, a major fossil fuel state intends to join the Regional Greenhouse Gas Initiative (RGGI).

Pennsylvania is second to Texas in natural gas production, and third behind Wyoming and West Virginia in coal. Its Governor, Tom Wolf (D) said: "If we want a Pennsylvania that is habitable for our children and grandchildren, where temperatures aren't in the 90s in October ... where flooding doesn't destroy homes and businesses over and over again, we need to get serious right now about addressing the climate crisis."

"If Pennsylvania joins the Northeast's carbon market for cutting greenhouse gas emissions from the power sector, it would be the largest expansion of the initiative since its inception a decade ago and a milestone in the drive by states to counter the impact of the Trump administration's retreat from climate action."

If Pennsylvania joins the Northeast's carbon market for cutting greenhouse gas emissions from the power sector, it would be the largest expansion of the initiative since its inception a decade ago and a milestone in the drive by states to counter the impact of the Trump administration's retreat from climate action.

Pennsylvania would become the largest member in terms of carbon emissions of RGGI, now a nine-state compact to curb pollution from electricity. The other states are NY, ME, VT, MD, CT, MA, DE, NH and RI.

But Wolf's plan to join RGGI may require action by the Republican-controlled state legislature. The Wolf administration shared a proposal indicating that legislative action is needed to authorize spending the hundreds of millions of dollars per year in proceeds from carbon fees that the state should receive from RGGI. Wolf noted

that electricity prices have fallen in the RGGI states while rising overall in the nation.

New Jersey was an original RGGI member but Gov. Chris Christie (R) withdrew it. NJ is currently working to establish rules to rejoin RGGI, perhaps by Jan. 1, 2020.

Virginia Gov. Ralph Northam (D) tried to join RGGI but was blocked earlier this year by the state's Republican-controlled legislature.

Pennsylvania's move is significant because it would bring the first major fossil fuel producer into RGGI. Because RGGI puts a price on carbon in the electricity marketplace, it reduces demand for those fuels — with coal taking the biggest hit at first.

Pennsylvania gets 40% of its power from nuclear energy, about twice the national average, and the state's nine nuclear power stations have struggled to compete against abundant, cheap natural gas. Some Pennsylvania lawmakers have been pushing the idea of a direct ratepayer subsidy to bail out the nuclear industry—a move that would raise electricity prices throughout the state.

Since RGGI started in 2009, participating states have cut their carbon emissions from electric generation by 47% which is 90% faster than the rest of the country, according to a study by the nonprofit Acadia Center.

Electricity prices in RGGI states have fallen 5.7%, while rising in the rest of the country by 8.6%. Their economies have grown at a faster pace than those of other states, and they've generated $3.2 billion in revenue from the carbon permit auction system.

Washington

A report from the National Task Force on the Rule of Law and Democracy, a nonpartisan taskforce of former government officials, found that the treatment of science by the Trump administration has hit a "crisis point" where research findings are manipulated for political gain, special interests are given improper influence and scientists are targeted for ideological reasons. Safeguards meant to ensure that government research is objective and fully available to the public are now at a nadir under Trump.

The report states that there are "almost weekly violations" of previously cherished norms, with the current administration attempting "not only to politicize scientific and technical research on a range of topics, but also, at times, to undermine the value of objective facts themselves."

The report echoes complaints by a number of former federal government officials who claim their work on areas such as the climate crisis and pollution standards was either sidelined or subverted by the Trump administration as part of its zeal for environmental deregulation.

"Politics is driving decisions and has been for some time," said Christine Todd Whitman, a Republican and former administrator of the EPA. Whitman co-chairs the taskforce with former U.S. attorney Preet Bharara. "Right now, any finding that seems to be restricting business, especially the energy industry, appears to be destined for elimination," Whitman said.

The taskforce, formed under the Brennan Center for Justice at the NYU School of Law, cites the recent "sharpiegate" scandal, in which Trump erroneously claimed a hurricane would hit Alabama, subsequently holding up a doctored map. Officials at the National Oceanic and Atmospheric Administration were reportedly pressured to back the president or risk being fired.

In another case, economists at the Department of Agriculture were relocated after they published findings showing the Trump administration's trade policies would harm farmers. Agriculture Secretary Sonny Perdue attempted to relocate 547 employees from the Economic Research Service and the National Institute of Food and Agriculture from Washington, D.C. to Kansas City, Missouri.

At the EPA, scientific advisory boards have been redrawn to include more industry representatives. The EPA's leadership also told scientists to reverse their findings in a report that showed the economic benefits to protecting wetlands from pollution, while suppressing a separate study that found a far greater threat is posed by a toxic chemical in water than previously thought.

"Let's face it, without credible science the fundamental responsibilities of our government are threatened," said Thomas Burke, who was a senior official in the EPA's office of research and development during the Obama administration. "I fear the public has lost faith in our agencies, and our best and brightest are being discouraged and blocked from federal service."

Climate Change Not on Agenda For 2020 G7 Summit

Climate change will not be discussed when Trump hosts the Group of Seven summit next year in the US. Mick Mulvaney, still "acting" as the White House chief of staff, said that the G7 summit would be held at Trump National Doral, Florida from June 10-12, 2020 (after an uproar a new location will be selected), and that "climate change will not be on the agenda."

The topic has been one of contention among G7 leaders as Trump calls the crisis a hoax and questions government reports that warn of serious consequences if action isn't taken. At the most recent summit, Trump was notably absent from a session on climate change that was attended by all of the heads of government of the other six countries.

Recent Decisions and Legislation in Environmental Law

Bonacker Property, LLC v. Village of East Hampton Board of Trustees, 168 A.D.3d 928 (N.Y. App. Div. 2019)

Facts

The petitioners, as owners of real property in the Village of East Hampton, commenced this action to challenge five local laws amending the Zoning Code of the Village.[1] The petitioners specifically seek to annul a negative declaration under the State Environmental Quality Review Act (SEQRA) on grounds that "(1) the amendments are not in accordance with the Village's comprehensive plan, (2) the Board of Trustees (hereinafter the "Board") improperly relied on the recommendation of the Village Planning and Zoning Committee in adopting the amendments, and (3) the Board of Trustees failed to comply with the procedures mandated by SEQRA."[2] Three of the amendments targeted larger lot sizes, affecting building lots 40,000 square feet or more.[3] One challenged law, Local Law No. 13—2015, reduced the maximum allowable gross floor area for one and two family detached dwellings on such lots. Two laws, Local Laws No. 14-15—2015, also reduced the maximum amount of coverage for structures on 40,000 square foot lots and reduced the maximum allowable gross floor area for accessory buildings on such lots, respectively.[4]

Procedural History

The petitioners appealed from a decision of the Supreme Court, Suffolk County, which found the challenged local laws were legal, constitutional, and a valid application of the zoning and police powers of the Village of East Hampton.[5]

Issue

Whether the approved amendments by the Board were in accordance with the Village's comprehensive plan, valid pursuant to SEQRA, and based upon properly relied on recommendation from the Village Planning and Zoning Committee?

Rationale

When a village has adopted a comprehensive plan, Village Law states "the village's zoning decisions must be in accordance with that plan," and the municipality's judgment, as to certain comprehensive plan provisions, must control.[6] The court ruled the petitioners failed to establish the contested amendments were inconsistent with the Village's comprehensive plan, especially considering the plan recommended, *inter alia*, limiting the maximum allowable gross floor area for new residential lots.[7] Therefore the zoning decision was in accordance with the Village comprehensive plan.

A judicial review of a SEQRA finding is restricted to "whether the determination was made in accordance with lawful procedure . . . and whether . . . the determination was affected by an error of law or was arbitrary and capricious . . ."[8] The court must determine whether the Board has procedurally and substantively followed SEQRA, while identifying areas of concern and taking a "hard look" at them.[9] The court found the Board complied with SEQRA because the environmental assessment forms prepared in connection with the proposed amendments found no adverse environmental impacts resulting from the amendments and because the Board took the required "hard look" at these impacts, while making "a reasoned elaboration of the basis of its determination."[10]

Lastly, the court reasoned that the Board acted properly in relying on the recommendation of the Planning and Zoning Committee because the Committee's role was advisory, it did not perform government functions, and as such is not a public body requiring that the petitioners be given notice or an opportunity to comment on the proposed amendments.[11]

Conclusion

The appellate court found the challenged amendments were in conformity with the Village comprehensive plan, that the Board validly adhered to SEQRA procedures, and that the Board acted appropriately when reviewing the recommendation of the Planning and Zoning Committee.

Benjamin Northrup
Albany Law School '20

Endnotes

1. *Bonacker Property, LLC v. Village of East Hampton Board of Trustees*, 93 N.Y.S.3d 328, 330 (N.Y. App. Div. 2019).
2. *Id*. at 330-331.
3. *Id*.
4. *Id*.
5. *Id*. at 329.
6. *Id*. at 330-331; see also McKinney's Village Law § 7-722; *Stringfellow's of N.Y. v. City of New York*, 91 N.Y.2d 382, 386 (1998).
7. *Bonacker*, 168 A.D.3d at 331-332.
8. *Id*. at 332.
9. *Id*.; *Matter of Jackson v. New York State Urban Dev. Corp.*, 67 N.Y.2d 400, 417 (1986).
10. *Id*. at 333.
11. *Id*. at 331-32.

City of Taunton v. U.S. Envtl. Prot. Agency, 895 F.3d 120 (1st Cir. 2018)

Facts

The Environmental Protection Agency (EPA) imposes a limit on the amount of nitrogen that may be discharged into watersheds pursuant to The Clean Water Act (hereinafter "CWA"), which "prohibits the 'discharge of any pollutant' unless that discharge complies with [National Pollutant Discharge Elimination System] NPDES permit requirements."[1] NPDES permits must include any water-quality-based limitations necessary to in order to ensure compliance with state water quality standards, these permits must control all pollutants the EPA determines will cause, potentially cause, or contribute to a deviation above any state water quality standard.

In this case, the EPA assigned nitrogen discharge limits to six non-minor point-sources of nitrogen into the Taunton Estuary; the second largest point-source discharger into the Taunton River watershed is the Taunton Wastewater Treatment Plant ("Facility").[2] The City of Taunton's (the "City") most recent NPDES draft permit, issued in 2013, limited nitrogen discharges to a concentration of 3.0 mg/l.[3]

Procedural History

After the EPA issued a draft permit in 2013, public comments led the EPA to conclude that nitrogen limits may be imposed because the Taunton River and Mount Hope Bay were "suffering from the adverse water quality impacts of nutrient overenrichment."[4] The EPA rejected supplemental comments submitted by the City due to untimeliness, and declined to address these supplemental comments in its general response to public comments.[5]

The City appealed to the Environmental Agency Board (EAB), which denied the City's challenge on three grounds: (1) the "need for any nitrogen limit and the specific limit that the permit imposed"; (2) to supplement the record with the previous supplemental comments the EPA declined to address; and (3) the City's administrative appeal, and the motion for reconsideration, on the merits.[6]

In an appeal to the United States Court of Appeals for the First Circuit, the City challenged the EAB final action on both procedural and substantive grounds, moving to supplement the record with the supplemental comments, and the EPA moved to strike the portion of the City's brief which referenced these documents.[7]

Issue

The court addressed the following procedural questions: (1) Did the EPA act arbitrarily and capriciously in its declination to consider the City's supplemental comments due to the untimeliness of their submission, and (2) did the final permit depart impermissibly from the fact sheet and draft permit, and did the EPA illicitly add information such as site-specific studies, data analysis, and regulatory findings to the final record?

The court addressed the following substantive questions: (1) Did the EPA err in determining that Taunton Estuary was nutrient impaired, (2) was the EPA's methodology for determining a target nitrogen concentration level flawed, and (3) did the EPA fail to take existing conditions in the Taunton Estuary into account in determining the permit's nitrogen limitation levels?

Rationale

The court held that the City failed to show it was procedurally entitled to anything more than what the EPA afforded it, and that the EPA's actions were not arbitrary or capricious.[8] The court stated that the City did not meet the burden of showing it should be permitted to supplement the administrative record in existence, and the City did not fit within the exceptions that allow the court to consider supplemental evidence to an administrative record.[9] The court found that the focal point in reviewing an agency's decision should be the administrative record already in existence, not a new record created in the reviewing court.[10] The City did not fall within the court stated exceptions to the above rule; thus, the court found it inappropriate for the City to utilize documents outside the record.[11]

The court granted the EPA's motion to strike and denied the City's motion to supplement the record.[12] The court found that "[b]ecause the agency record at issue [] pertains to an informal adjudication, section 509(c) of the CWA . . . does not provide a basis for [the court] to order the EPA to reopen the administrative record to consider the City's purportedly new material evidence."[13]

The court found that the neither the EPA nor the EAB acted arbitrarily or capriciously in their reliance upon the submitted fact sheet.[14] The court found that the EPA laid out in "substantial detail" the methodology employed, its reasoning and underlying assumptions in the datasets, and studies relied upon in determining the nitrogen limit.[15] The court further found that the EPA did not abuse its discretion in its failure to reopen the public comment period.[16]

Pertaining to the City's substantive challenges the court held that "the EPA did not act arbitrarily or capriciously in determining that the Taunton Estuary and Mount Hope Bay were already nutrient impaired, and that further nitrogen discharges would have at least a "reasonable potential" to give rise to violations of state water quality standards."[17] Further, the court stated that the EPA did not act arbitrarily or capriciously in their use of the Critical Indicators Report improperly because the use of those indicators to determine that the "Taunton Estuary was nutrient impaired for purposes of Massachusetts's narrative criteria comported with the regulations

that govern translating narrative criteria in the absence of an official state-sanctioned methodology."[18]

The court found that the EPA's methodology for determining a target nitrogen concentration level was not flawed: "[w]here [an] agency follows the proper procedures and acts with a reasonable basis, both its choice of scientific data and interpretation and application of that data to real world conditions are entitled to deference."[19] Finally, the court found that the EPA did not fail to consider existing conditions in the Taunton Estuary as the EPA's detailed explanation of how it calculated the limit fell within the "zone of reasonableness."[20]

Conclusion

The court determined that the City failed to show its substantive and procedural challenges had merit where the EPA did not act arbitrarily or capriciously and was reasonable in the determination of the NPDES nitrogen discharge limit.

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Endnotes

1. *City of Taunton v. U.S. Envtl. Prot. Agency*, 895 F.3d 120, 123–24 (1st Cir. 2018).
2. *Id.* at 125, 139.
3. *Id.*
4. *Id.* at 125.
5. *Id.*
6. *Id.*
7. *Id.* at 124, 128.
8. *Id.* at 132.
9. *Id.*
10. *Id.* at 127.
11. *Id.*
12. *Id.* at 128.
13. *Id.*
14. *Id.* at 132.
15. *Id.* at 130.
16. *Id.*
17. *Id.* at 137. The data used included an interim report prepared for the Massachusetts Department of Environmental Protection called the Critical Indicators Report, a three-year water quality monitoring study, data from a Mount Hope Bay monitoring station. *Id.* at 134.
18. *Id.* at 135–36.
19. *Id.* at 138 (quoting *Upper Blackstone Water Pollution Abatement Dist. v. United States Envtl. Prot. Agency*, 690 F.3d 9, 26 (1st Cir. 2012)).
20. *Id.* at 141.

Knick v. Township of Scott, No. 17-647, 2019 WL 2552486 (U.S. June 21, 2019)

Facts

In 2012, the Scott Township of Pennsylvania passed an ordinance requiring that all cemeteries, whether on private or public property, be open and accessible to the public during the daytime.[1] When code enforcement officers entered the 90-acre rural property of Petitioner Rose Mary Knick, they notified her that she was in violation of the ordinance because of a small family graveyard located on her property.[2] Knick sought declaratory and injunctive relief in Federal District Court, alleging that the ordinance constituted a taking that was in violation of Fifth Amendment Takings Clause, which prohibits the taking of private property for public use without just compensation.[3] In the 1985 case of *Williamson County Regional Planning Comm'n v. Hamilton Bank of Johnson City*, the Supreme Court held that when a local government has taken private property for public use, that property owner has not suffered a violation of their Fifth Amendment rights until a state court has denied a claim for just compensation.[4] Thus, under *Williamson County,* the District Court dismissed Knick's claim against the Township of Scott because she had not first sought compensation through an inverse condemnation action in state court.[5] On appeal, the Third Circuit affirmed the District Court's decision, although the Third Circuit described the ordinance as "extraordinary and constitutionally suspect."[6]

Procedural History

After Knick's action in Federal District Court was dismissed and subsequently affirmed by the Third Circuit, the Supreme Court granted certiorari to reconsider the holding of *Williamson County*.[7]

Issue

At issue in the case was whether "property owners must seek just compensation under state law in state court before bringing a federal takings claim."[8]

Rationale

The doctrine of *stare decisis* has traditionally been viewed as a mechanism ensuring consistency, stability and the apolitical character expected of law. Regardless of particular political or personal views, Justices apply (rather than revisit) law that has been previously decided. *Stare decisis* can be an obstacle to changing course but as we saw in the Court's decision to overturn *Baker v. Nelson* in *Obergefell v. Hodges* and lift the ban on same-sex marriages, the high bar for ignoring past precedent can be overcome.[9] To the majority, the controversy in *Knick* offered a similar opportunity.

The takings clause of the Fifth Amendment provides: "[N]or shall private property be taken for public use, without just compensation." Observing that the text does

not say: "Nor shall private property be taken for public use, without an available procedure that will result in compensation,"[10] the Court asserted that the Framers of the Constitution "meant to prohibit the Federal Government from *taking* property without paying for it" and had not intended for the government to possess the capability to keep property "pending subsequent compensation to the owner."[11] Relying on reasoning from *Jacobs v. United States,* the Court reasoned that "just as the existence of a state action for battery does not bar a Fourth Amendment claim of excessive force," the possibility of a property owner receiving a compensation remedy does not bar them from a federal constitutional claim.[12] Moreover, the Court noted an unintended consequence of *Williamson County*—that the very state court decisions required under *Williamson County* to "ripe[n] federal takings claim[s]" may actually preclude meaningful adjudication of such claims in federal court.[13] The Court stated that a taking without compensation violates a "self-executing Fifth Amendment" at the time of the taking and, therefore, concludes that a property owner may bring a Fifth Amendment claim at that time.[14]

The Court appeared to contemplate the effect of its decision on *stare decisis* while diverging from the *Williamson County* decision,[15] writing that the reasoning in *Williamson County* was "exceptionally ill-founded and conflicted with much of our takings jurisprudence."[16] Furthermore, the Court noted that power of *stare decisis* is less persuasive when "rules that do not 'serve as a guide to lawful behavior' are at issue."[17] The Court excuses its abdication of *stare decisis* by arguing that its holding will not create new liabilities for governments, but will "simply allow into federal court takings claim that otherwise would have been brought as inverse condemnation suits in state court."[18]

In his concurrence, Justice Thomas agreed with the Court's interpretation of the Fifth Amendment's Takings Clause by concluding that "a violation of this Clause occurs as soon as the government takes property without paying for it."[19] Justice Thomas reasoned that the Fifth Amendment is not a mere damages remedy for property owners willing to "shoulder the burden of securing compensation."[20] Alternatively, Justice Thomas argued that the Takings Clause makes just compensation a "prerequisite" to the taking of property for public use by the government.[21]

Justice Kagan authored a dissenting opinion and was joined by Justice Ginsburg, Justice Breyer and Justice Sotomayer. Justice Kagan noted that the formal overruling of *Williamson County* rejects a deep-rooted understanding of the Fifth Amendment's Takings Clause.[22] The dissent provided a different interpretation of the Takings Clause.[23] According to Justice Kagan, the Takings Clause does not confer the right to be free from government takings of property for public purposes, but the right to be free from "those takings when the government fails to provide 'just compensation.'"[24] The dissent further disapproved of the majority's avoidance of "a mountain of precedent" in declaring that a government must pay compensation at the moment of taking private property, or in advance.[25] Citing *Cherokee Nation*, the dissent argued that if the government fails to pay at the moment or in advance of the taking, a constitutional violation will have occurred, regardless of whether "reasonable, certain and adequate," compensatory mechanisms are in place.[26] In regard to the majority's concern that federal claims would be precluded by the state claims required by *Williamson County*, the dissent argued that "highlighting the preclusion concern" makes the case for respecting *stare decisis* because "that issue can always be addressed by Congress."[27] In conclusion, the dissent condemned the majority's decision on grounds that "the entire idea of *stare decisis* is that judges do not get to revise a decision just because they never liked it in the first instance."[28]

Conclusion

The Court overruled the state-litigation requirement of Williamson County. Under this decision, a property owner may bring a takings claim directly to Federal Court upon the taking of his property without just compensation by a local government.[29] It is possible that the *Knick* decision will have little impact, except to ensure quicker access to federal courts. However, it is likely that the complicated differences of state and local laws will pose challenges for the federal courts that will now have to navigate them. Moreover, the majority opinion here is likely to reignite interest and dialogue on the role of courts in the evolution of law and whether that includes adhering to past precedent in order to abide by a legal doctrine.

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Endnotes

1. *Knick v. Twp. of Scott*, No. 17-647, 2019 WL 2552486, at 3 (U.S. June 21, 2019).
2. *Id.* at 4.
3. *Id.* at 3, 4.
4. *Id.* at 3.
5. *Id.* at 4.
6. *Id.* at 4.
7. *Id.*
8. *Id.*
9. *Baker v. Nelson*, 409 U.S. 810 (1972). *Obergefell v. Hodges*, 135 S. Ct. 2584 (2015).
10. *Knick v. Twp. of Scott*, No. 17-647, 2019 WL 2552486, at 5 (citing 42 U.S.C. § 1983).
11. *Id.*
12. *Id.* at 6. (citing *Jacobs v. United States*, 290 U.S. 13 (1933)).
13. *Id.* at 5.
14. *Id.* at 7.

15. *Id.* at 11.
16. *Id.* at 12.
17. *Id.* at 13. (quoting *United States v. Gaudin*, 515 U.S. 506, 521 (1995)).
18. *Id.* at 13.
19. *Knick v. Twp. of Scott*, No. 17-647, 2019 WL 2552486, at 13.
20. *Id.* at 14 (citing *Arrigoni Enterprises, LLC v. Durham*, 578 U.S. ——, 136 S.Ct. 1409, 1409 (2016)).
21. *Id.* at 14.
22. *Id.*
23. *Id.*
24. *Id.*
25. *Id.* at 16.
26. *Id.* at 15. (citing *Cherokee Nation v. Southern Kansas R. Co.*, 135 U.S. 641 (1890)).
27. *Id.* at 21.
28. *Id.*
29. *Id.* at 13.

New York v. Environmental Protection Agency, 921 F.3d 257 (D.C. Cir. 2018)

Facts

Several States in the "Northeast Ozone Transport Region" (Connecticut, Delaware, Maryland Massachusetts, New York, Pennsylvania, Rhode Island, and Vermont) established by Congress in the Clean Air Act Amendments of 1990, requested that the Environmental Protection Agency (EPA) expand the region to include a number of upwind States.[1] Members of the Northeast Ozone Transport Region are required to implement mandatory ozone controls, including "enhanced vehicle-inspection and maintenance programs in densely-populated areas, reasonably available control technology for emissions sources, vehicle-refueling controls for vapor recovery, and heightened permitting and control requirements applicable to major stationary sources."[2] The basis for the requested expansion is the formation and migration of ozone, as "ozone-laden air slowly moves downwind, and as the air mass moves, ozone levels often increase… Ultimately, this process can bring high ozone levels to areas hundreds of miles downwind of the pollution sources."[3] The court noted that as a result, "downwind States may be hampered in their efforts to control their ozone pollution levels."[4]

In the denial of the States' request, EPA wrote that it intended to rely on a "good-neighbor" provision and "section 126 petitions," two other sections in the Clean Air Act.[5] A State may violate the good-neighbor provision, and therefore be subject to an EPA-imposed plan to remedy the violation, if it emits "pollutants that 'contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to' the relevant air quality standards."[6] Section 126 petitions provide a mechanism through which states may petition EPA for review of potential violators of the good-neighbor provision.[7]

Procedural History

EPA denied the request by the States to expand the Northeast Ozone Transport Region, after which the States filed a petition seeking judicial review of the administrative decision.[8]

Issue

At issue in the case is "whether EPA's decision was arbitrary and capricious or otherwise contrary to law."[9]

Rationale

As a preliminary matter, the court notes that the States are unable to provide textual support for a limitation of the EPA's discretionary power in decisions regarding the expansion of an ozone transport region.[10] While the Clean Air Act requires that a petition to expand an ozone transport region include a showing that there is reason to believe that interstate transport of air pollutants "significantly contributes" to a violation of air quality standards, "this requirement is a necessary but not sufficient condition for expansion of the region."[11] Although the States argued that EPA's reliance on other sections of the Clean Air Act would not solve the problem of ozone pollution, the court found that the statute does not require EPA to expand a region simply because other tools do not completely eliminate the problem.[12]

The court wrote that it could not set aside EPA's decision without concluding "that EPA had not 'adequately explained the facts and policy concerns it relied on' or that those facts did not 'have some basis in the record.'"[13] Here, EPA based its decision on "historical use of the good-neighbor provision and the ongoing downward trend in ozone pollution."[14] Such a basis was sufficient to meet the standard of review, the court found, and wrote that "nothing more is required under the extremely deferential review we must apply here."[15]

Conclusion

The court concluded that EPA's denial of the States' petition to expand the Northeast Ozone Transport Region was proper and "a reasonable exercise of the agency's discretion."[16] Accordingly, the Court likewise denied the States' petition for judicial review.[17]

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Endnotes

1. *New York v. Environmental Protection Agency*, 921 F.3d 257, 259 (D.C. Cir. 2018).
2. *Id.* at 260 (citing 42 U.S.C. § 7511c(b)).
3. *Id.* at 259 (quoting *Virginia v. EPA*, 108 F.3d 1397, 1399-1400 (D.C. Cir. 1997)).
4. *Id.* at 259.
5. *Id.* at 260 (citing EPA Denial, 82 Fed. Reg. at 51,242).

6. *Id.* (citing 42 U.S.C. § 7410(a)(2)(D)(i)(I)).
7. *See* 42 U.S.C. § 7426(b).
8. New York, 921 F.3d 257 at 258.
9. *Id.* at 259.
10. *Id.* at 262.
11. *Id.* (citing 42 U.S.C. § 7506(a)(a)).
12. *Id.*
13. *Id.* at 261 (quoting *WildEarth Guardians v. U.S. E.P.A.*, 751 F.3d 649, 653 (D.C. Cir. 2014)).
14. *Id.* at 262 (citing EPA Denial, 82 Fed. Reg. at 51,243-47).
15. *Id.* at 262.
16. *Id.* at 263.
17. *Id.*

Finger Lakes Zero Waste Coal., Inc. v. U.S. Envtl. Prot. Agency, 734 F. App'x 11 (2d Cir. 2018)

Facts

Seneca Energy II, LLC ("Seneca Energy") operates a facility in Ontario County, which converts gas from a nearby landfill into energy.[1] The landfill is located on the same or adjacent property as the facility, is owned by Ontario County, and is leased and operated by Casella Waste Systems of Ontario, LLC.[2] In 2011, Seneca Energy applied to the Department of Environmental Conservation (DEC) to renew and modify its Title V permit for this facility.[3] While the permit was open for public comment, the Finger Lakes Zero Waste Coalition, Inc. (the "Coalition") submitted public input seeking to demonstrate that the facility and landfill were under "common control" and to have the application analyzed as a major source of pollution.[4] The DEC responded with an 11-page summary responding to the issues raised and affirming its decision that the facility and landfill were not under common control.[5] The proposed permit was then submitted to the Environmental Protection Agency (EPA) for review; the EPA did not object to the permit within forty-five days.[6]

Pursuant to 40 C.F.R. § 70.8(d), the Coalition submitted a petition on December 22, 2012, to the EPA to object to the permit.[7] The EPA did not respond to this petition until June 29, 2015, when it decided that the DEC had not adequately addressed the Coalition's concerns and directed the DEC to provide a record of the facts used to make their determination.[8] On October 26, 2015, the DEC responded with a "Source Determination" which provided additional information and concluded that the facility and landfill were not under common control.[9] On February 8, 2016, the Coalition submitted a petition to reopen the decision, the EPA Administrator denied the petition as both a petition to reopen and a petition to object to the decision of the EPA.[10]

Procedural History

The Coalition petitioned the Second Circuit to review the denial of the Title V petition to object to or reopen the EPA's decision.[11]

Issue

Whether the EPA acted arbitrarily and capriciously in denying the Coalition's petition to reopen or object to the Title V permit.[12]

Rationale

Relying on 40 C.F.R. § 70.7(f)(1), the Second Circuit found that the petition to reopen "did not mention the relevant legal framework for the reopening of a case."[13] Additionally, the Second Circuit found that the petition to object to the Title V permit was insufficient as it did not respond to the 2015 DEC Source Determination.[14] Therefore, the Second Circuit determined that because the petition was "inadequate under the relevant statutory framework," it was not arbitrary or capricious for the EPA Administrator to deny the petition.[15]

The Second Circuit further found that the 2015 Source Determination by the DEC did include additional information and facts for the EPA to consider, providing a proper basis to deny the petition that was not arbitrary or capricious.[16]

Conclusion

The Second Circuit determined that the EPA's decision to deny the Coalition's petition to reopen or object to the Title V permit was not arbitrary or capricious and denied the Coalition's petition for review of the EPA order.

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Endnotes

1. *Finger Lakes Zero Waste Coalition, Inc. v. U.S. Envtl. Prot. Agency*, 734 F. App'x 11, 12 (2d. Cir. 2018).
2. *Id.* at 13.
3. *Id.*
4. *Id.* at 13-14.
5. *Id.* at 14.
6. *Id.*
7. *Id.*
8. *Id.*
9. *Id.*
10. *Id.*
11. *Id.* at 15.
12. *Id.*
13. *Id.*
14. *Id.*
15. *Id.*
16. *Id.*

Sierra Club v. Con-Strux, LLC, 911 F.3d 85 (2d Cir. 2018)

Facts

Construx is the operator of a New York facility that "recycles demolished concrete, asphalt, and other construction products that it then processes and resells on the wholesale market for use by the construction industry."[1] The Sierra Club claims that the facility generates a variety of pollutants that are regularly exposed to stormwater, which qualifies as "'industrial activity' requiring a permit, and it is undisputed that Construx does not have a permit."[2] Construx claims that it "processes only 'recognizable uncontaminated concrete, asphalt pavement, brick, soil or rock . . . 'and is therefore not required to obtain a permit.'"[3]

Procedural History

Sierra Club brought an action against Construx seeking declaratory and injunctive relief.[4] The United States District Court for the Eastern District of New York dismissed action for failure to state a claim, since Construx's activities were not covered under the Clean Water Act.[5] Sierra Club appealed.[6]

Issues

Whether Construx engaged in "industrial activity" within the meaning of Standard Industrial Classification (SIC) 5093 under the Clean Water Act (CWA) "such that Construx was required to comply with CWA's permitting scheme."[7]

Rationale

Storm water runoff that is "associated with certain enumerated activities" which includes "discharge associated with industrial activity," are subject to regulations under CWA and requires permits.[8] The EPA provided guidance "by supplying Categories of facilities that 'are considered to be engaging in "industrial activity."'"[9] The categories include "[f]acilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification [(SIC)] 5015 and 5093."[10]

The district court determined that Construx's activities were more properly classified under SIC 5032, which is not a listed category covered under the CWA.[11] The district court "focused on SIC 5032's specific reference to stone, brick, asphalt, concrete, and aggregate, materials [which are] not listed in SIC 5093 but which are the focus of Construx's business."[12] The Second Circuit disagreed.[13]

On appeal, the Second Circuit was to determine whether the Constux's "industrial activity" was covered under SIC 5093, and thus subject to CWA.[14] SIC 5093, "entitled 'Scrap and Waste Materials,' encompasses '[e]stablishments primarily engaged in assembling, breaking up, sorting, and wholesale distribution of scrap and waste materials.'"[15] Included in the section is a list of certain materials, as well as a list that "appears to be a catch-all category identified only as '[s]crap and waste materials—wholesale."[16] Further, SIC 5093 covers businesses "primarily engaged in assembling, breaking up, sorting, and wholesale distribution of scrap and waste materials."[17]

Based on Construx's own description, their "business involves two distinct processes, each equally important to the business model: (1) recycling 'construction waste' and (2) wholesaling aggregate materials it has crushed down from that construction waste."[18] The court concluded that "processing construction debris and waste for recycling fits within the definition of activities covered under SIC 5093."[19] Thus, although the court agreed with the district court that SIC 5032 captures some of Construx's business activities, the district court "erred by discounting a significant portion of Construx's business operations."[20]

Construx protested, arguing that the district court properly concluded that SIC 5032 was a better classification rather than SIC 5093.[21] However, nothing in the Act suggests that the classifications under the Act are "an either-or proposition."[22] Thus, "even if Construx's business is properly classified under SIC 5032, that does not preclude a finding that it is also properly classified under SIC 5093."[23]

Conclusion

The court concluded that the district court improperly dismissed the complaint, holding that "Sierra Club's allegations were sufficient to demonstrate, at the pleading stage, that Construx was engaged in 'industrial activity,'" under the CWA.[24] The district court's dismissal of the action was vacated and the case was remanded for further proceedings consistent with the decision.[25]

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Endnotes

1. *Sierra Club v. Con-Strux*, LLC, 911 F.3d 85, 87 (2d. Cir. 2018).
2. *Id.*
3. *Id.* at 88.
4. *Id.* at 85.
5. *Id.*
6. *Id.*
7. *Id.* at 87.
8. *Id.* (quoting 33 U.S.C. § 1342 (p)(2)(B)).
9. *Id.*
10. *Id.* (quoting 40 C.F.R. § 122.26 (b)(14)(vi)).
11. *Id.* at 88.
12. *Id.*
13. *Id.* at 86.

14. *Id.*
15. *Id.* at 87.
16. *Id.*
17. *Id.* 88–89.
18. *Id.* at 88.
19. *Id.*
20. *Id.*
21. *Id.* at 89.
22. *Id.*
23. *Id.*
24. *Id.* at 86.
25. *Id.*

Sierra Club v. U.S. Envtl. Prot. Agency, 895 F.3d 1 (D.C. Cir. 2018)

Facts

The Sierra Club and the Natural Resources Defense Council brought suit against the EPA over its final rule for the "Brick/Clay Rule."[1] The Sierra Club and Natural Resources Defense Council alleged that "the EPA erred in its use of health-based standards for acid gas emissions, failed to properly explain its methodology in setting maximum achievable control technology-based [(MACT)] standards, and improperly allowed brick plants to meet alternative emissions floors."[2] Alternately, the Brick Industry Association, the Tile Council of North America, Inc., and the Kohler Company, contend that the methodology used in the Brick/Clay rule had multiple errors.[3]

Following a Regulatory Impact Analysis, the EPA listed brick and ceramic kilns as major sources of hazardous air pollution and concluded it is therefore required to regulate their emissions.[4] The MACT standard is set based on the maximum limit of emissions that can be achieved, in which the EPA sets a minimum based on the average emissions that can be achieved by the lowest-emitting existing sources.[5] The EPA can also set health-based standards where a health threshold has been established and must set such standards with an ample margin for safety.[6]

Procedural History

Following the final ruling of the EPA, the petitioners sought review of this decision, and the court consolidated the proceedings of the industry and environmental petitioners.[7]

Issue

Whether the EPA's ruling on the Brick/Clay Rule was arbitrary, capricious, an abuse of discretion or otherwise not in accord with the Clean Air Act.

Rationale

The court evaluated the EPA's decision using a two-step framework. First, the court "determine[s] if Congress has 'directly spoken to the precise question at issue,'" and if so, the court must "give effect to the unambiguously expressed intent of Congress."[8] If Congress has not directly spoken to the question then the court will "defer to the EPA's interpretation of the CAA so long as it 'is based on a permissible construction of the statute.'"[9]

The environmental petitioners claimed that the EPA did not adequately establish that certain pollutants posed no health risk and proposed that "establish" be interpreted to mean, "prove beyond a reasonable doubt."[10] The court concluded that while the CAA did not require the EPA to prove beyond a reasonable doubt all of its scientific conclusions, the statute does require the agency to rely on sufficient evidence in coming to such a conclusion.[11] The court required that the EPA rely on "significant studies" to base its standards on and failed to do so when making the Brick/Clay rule.[12]

The CAA requires that the EPA include an "ample margin of safety" when it sets health-based standards, and because the EPA failed to provide a sufficient explanation of how it determined its margin of safety, the court found that the EPA had violated the CAA.[13] The court agreed with the environmental petitioners on all arguments and granted the petition finding that the EPA had violated the CAA in its setting of health thresholds for acid gases.

Finally, the environmental petitioners argued that the EPA erred "in its provision of alternative MACT floors for brick kilns."[14] The court ruled that the practice of having alternative MACT floors and allowing regulated entities to choose was contrary to the CAA because the EPA does not have the discretion to define several different "best" metrics within the same category, allowing emitters to comply with the most favorable standard.[15]

The industry petitioners challenged the Brick/Clay rule's methodology for setting the MACT floor for their respective industry's kiln. First, the Brick Industry Association argued that "the EPA violated the CAA because it used synthetic sources to set the MACT floor for brick plant major sources."[16] The court disagreed, as the agency is afforded deference in how sources are categorized.[17] Second, the Brick Industry Association argued that "the EPA acted arbitrarily and capriciously because it did not correct, supplement, or reconcile suspicious data and used that data to set the MACT floor for . . . emissions from brick plants."[18] The court found that the EPA should be accorded deference on this issue because its determination was sufficiently reasoned.[19] Finally, the Brick Industry Association argued that "the EPA violated congressional intent by setting mercury emissions standards that require that the industry make raw material substitutions."[20] The court found that the MACT floors

were achievable without substituting raw materials and the EPA's decision to set the standard based on the best-performing sources is not a direct mandate to substitute raw materials.[21]

The Kohler Company challenged the use of kilns with scrubbers which were decommissioned but still functional and attached to the source at the time the data was taken.[22] The EPA asked Kohler to reactivate the scrubbers while it collected data, and Kohler claimed that data taken with operational scrubbers is not representative of the source.[23] The court found that the EPA had not violated the CAA by collecting data from this kiln because the emissions recorded with the scrubbers were achievable by the kiln "in practice."[24]

Conclusion

The court denied all petitions brought by the industry petitioners and granted the environmental petitioners' claims, except the petition for review regarding the upper prediction limit methodology. [25]

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Endnotes

1. *Sierra Club v. EPA*, 895 F.3d 1 (D.C. Cir. 2018).
2. *Id.* at 2.
3. *Id.*
4. *Id.* at 4.
5. *Id.*
6. *Id.*
7. *Id.* at 6.
8. *Id* at 9 (quoting *Chevron v. Natural Resources Defense Council*, 467 U.S. 837, 843 (1984)).
9. *Id.*
10. *Id.* at 10.
11. *Id.* at 10–11.
12. *Id.* at 11.
13. *Id.* at 8, 12–13.
14. *Id.* at 9.
15. *Id.* at 15.
16. *Id.* at 16.
17. *Id.* at 17.
18. *Id.*
19. *Id.* at 18–19.
20. *Id.* at 19.
21. *Id.* at 19–20.
22. *Id.* at 21.
23. *Id.*
24. *Id.* at 22.
25. *Id.*

101CO, LLC v. New York State Department of Environmental Conservation, 169 A.D.3d 1307, (N.Y. App. Div. 2019)

Facts

Respondents Sand Land Corporation and Wainscott Sand and Gravel Corporation operate a 50–acre sand and gravel mine in Bridgehampton, Suffolk County that has been active for nearly 60 years.[1] Petitioners are landowners that neighbor the mine.[2] Petitioners became aware of Sand Land and Wainscott's negotiations with DEC following two notices of violations issued in May 2015 and May 2016, sought and were denied inclusion in the negotiation process.[3] On November 10, 2016, respondents negotiated an order on consent resolving the DEC's enforcement action against respondents Sand Land and Wainscott.[4] This consent order required Sand Land and Wainscott to submit a remediation plan for DEC approval.[5] Petitioners were notified, by email, that the remediation plan had been approved on November 17, 2016.[6]

Petitioners filed a Freedom of Information Law (FOIL) request in November 2016 seeking copies and drafts of the consent order and remediation plan, along with related correspondence.[7] DEC immediately acknowledged receiving this FOIL request and by January 2017 produced "[a]ll records identified as responsive" to petitioners' FOIL request, including the consent order and remediation plan, with the exception of some redacted material and privileged documents.[8] Petitioners appealed this exclusion of material and on March 17, 2017 commenced an action pursuant to ECL 71–1311(2) seeking a determination regarding the partial denial of petitioners' FOIL request.[9] Following commencement of this action and proceeding, DEC produced additional documents pursuant to petitioners' appeal and initial FOIL request.[10]

Procedural History

The petitioners are appealing the judgment of the Supreme Court, Albany County in favor of the Department of Environmental Conservation (DEC) in an article 78 proceeding in which mine neighbors sought review of the Department's approval of a remediation plan.[11]

Issue

Whether the Supreme Court erred in dismissing petitioner's first three causes of action because they were untimely under the Statute of Limitations? Additionally, whether the Supreme Court erred in holding that the petitioner's first three causes of action were alternatively barred under the doctrine of laches and mootness? Additionally, whether the Supreme Court erred in holding that petitioner's FOIL claim was moot and that petitioners had not "substantially prevailed" for the purposes of obtaining counsel fees and costs?

Rationale

Petitioners are specifically challenging the remediation plan created by DEC, rather than the consent order.[12] The purpose of the remediation plan was to set forth the specific actions that respondents were to take to address the violations—none of which were detailed in the consent order—and any harm to petitioners was deemed to be "merely speculative" until the remediation plan was fully approved by DEC.[13] Therefore, it was correct for petitioners to rely on the approval of the remediation plan for accrual of their claims because the consent order was not the final and binding determination that triggered the four-month statute of limitations.[14]

A party asserting the defense of laches must "establish [his or her] lack of knowledge that [the petitioner] would assert claims ... and an unconscionable delay on [the petitioner's] part that induced [the respondent] to act or refrain from acting in ways that would prejudice [the respondent] if [the petitioner was] now permitted to assert such claims."[15] In this case, both DEC and the respondent mine owners were aware of petitioner's likelihood of asserting claims based on parallel litigation and petitioner's desire to be involved in the negotiation process.[16] Furthermore, there was no unreasonable delay as respondents had nearly completed work for the season under the remediation plan by the time petitioner was given a copy.[17]

"The doctrine of mootness is invoked where a change in circumstances prevents a court from rendering a decision that would effectively determine an actual controversy."[18] The Supreme Court relied upon respondent's completion of the remediation plan as a basis for dismissal under mootness. As stated above, respondents were aware of petitioner's grievances and their likelihood of bringing a claim and so engaged in completion at their own risk.[19]

A petitioner substantially prevails under Public Officers Law § 89(4)(c) when it "receive[s] all the information that it requested and to which it was entitled in response to the underlying FOIL litigation."[20] DEC asserted petitioners had not substantially prevailed because the six allegedly privileged documents were never turned over.[21] However, petitioners were not specifically seeking those six documents in their FOIL appeal, but instead were seeking more information on which documents were withheld and why.[22]

Conclusion

The Appellate Division found the Supreme Court erred and reversed the judgment granting respondents' motions to dismiss the first three causes of action on the bases of the statute of limitations, laches, and mootness as well as the denial of petitioners' request for counsel fees and costs. This case was remitted to the Supreme Court for findings not inconsistent with this judgment.[23]

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Endnotes

1. *101CO, LLC v. New York State Department of Environmental Conservation*, 169 A.D.3d 1307 (N.Y. App. Div. 2019).
2. *Id*.
3. *Id*.
4. *Id*.
5. *Id*.
6. *Id*. at 1308.
7. *Id*.
8. *Id*.
9. *Id*.
10. *Id*.
11. *Id*. at 1307.
12. *Id*. at 1309.
13. *Id*.
14. *Id*.
15. *Id*. at 1310 (quoting *Sparkling Waters Lakefront Assn, Inc. v. Shaw*, 42 A.D.3d 801, 803, 841 N.Y.S.2d 146 [2007]).
16. *Id*.
17. *Id*. at 1311.
18. *Id*. at 1310 (quoting *Matter of Dreikausen v. Zoning Bd. of Appeals of City of Long Beach*, 98 N.Y.2d 165, 172, [2002]).
19. *Id*. at 1311.
20. *Id*. (quoting *Matter of New York State Defenders Assn. v. New York State Police*, 87 A.D.3d 193, 196, [2011]).
21. *Id*. at 1312.
22. *Id*.
23. *Id*. at 1313.

New York State Dep't of Envtl. Conservation v. Segreto, 2019 N.Y. App. Div. LEXIS 1064 (N.Y. App. Div. 2019)

Facts

In 2005, the Department of Environmental Conservation (DEC) staff commenced an administrative enforcement proceeding alleging that Anthony J. Segreto (Segreto) cleared vegetation and placed fill on his property, located in Great South Bay in the Town of Islip, within a regulated tidal wetland area without obtaining the required DEC permit.[1] In 2008, the Commissioner issued an administrative order holding that Segreto violated Environmental Conservation Law (ECL) article 25 (The Tidal Wetlands Act).[2] Segreto was issued a $20,000 civil penalty pursuant to ECL § 71-2505 and was directed to submit a tidal wetlands restoration plan to the DEC.[3]

Procedural History

In 2011, DEC staff commenced an enforcement proceeding in the Supreme Court of Suffolk County and moved to recover the civil penalty of $20,000 and compel Segreto to submit a restoration plan.[4] In May of 2014, the Supreme Court denied Segreto's request to continue

activities on his property and ruled in favor of the DEC.[5] However, the Supreme Court denied DEC's motion for Segreto to pay a civil penalty on the basis that DEC staff failed to demonstrate that ECL § 71-2503 authorizes a civil penalty to be assessed by someone other than the Commissioner.[6]

Issue

Whether the DEC may gain a civil penalty of $20,000 from Segreto for the violation of ECL article 25 and whether the Attorney General is authorized under ECL § 71-7503 to seek this civil penalty in state court.[7]

Rationale

The Supreme Court, Appellate Division reversed and remanded the Supreme Court of Suffolk County's decision holding that DEC staff is entitled to judgment as a matter of law to recover a civil penalty against Segreto.[8] While the court asserted that DEC staff failed to demonstrate that a civil penalty can be issued by a party other than the Commissioner pursuant to ECL § 71-2503, the Appellate Division believes that the court should have reviewed the statutes plain language to determine the legislature's intent.[9] The court was mistaken to deny a civil penalty because pursuant to ECL § 71-2505 the Attorney General is authorized on "his or her own initiative" to prosecute individuals who violate article 25 and to seek civil penalties within state court without any prior administrative hearings.[10]

DEC staff established their entitlement to recovery of a civil penalty against Segreto because staff submitted evidence that demonstrated Segreto, between 2011 and 2012, cleared wetland vegetation, placed fill, constructed a bulkhead and a 900-foot fence on a tidal wetland and creek without a DEC permit.[11] Moreover, Segreto failed to raise any triable issues of fact in opposition.[12]

Conclusion

The Supreme Court, Appellate Division reversed the Supreme Court of Suffolk County's judgment and remanded the case to the court for further proceedings.[13]

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Endnotes

1. *New York State Dep't of Enviro. Conservation v. Segreto*, 2019 N.Y. App. Div. LEXIS 1064, 1 (N.Y. App. Div. 2019)
2. *Id*.
3. *Id* (citing ECL § 71-2503 and ECL § 71-2505).
4. *Id*.
5. *Id*.
6. *Id*.
7. *Id*.
8. *Id*.
9. *Id.* (citing *Feinman v, County of Nassau*, 154 A.D.3d 739 (2d Dep't, Oct. 11, 2017; quoting *Matter of Tompkins County Support collections Unit v. Chamberlin*, 99 N.Y.2d 328, 335 (2003)).
10. *Id.* (citing ECL § 71-2505).
11. *Id*.
12. *Id*.
13. *Id.* at 2.

Lakeview Outlets Inc. v. Town of Malta, 166 A.D.3d 1445 (N.Y. App. Div. 2018)

Facts

The State Environmental Quality Review Act (SEQRA) requires a generic environmental impact statement (GEIS) for the purposes of evaluating potential cumulative impacts associated with development within a community.[1] The Town Board of Malta adopted the findings of the GEIS in 2006, which, based on the estimated use of space, traffic and recreational development of the community over the next 10 years provided for the assessment of mitigation fees to developers.[2] The GEIS also provided that any '"future action associated with development in the Town . . . undertaken in conformance with the baseline conditions established in th[e] GEIS or [the Town Board's] Finding Statement' would not be subject to further SEQRA review."[3] In 2014, based on the Town Zoning Board of Appeals' recognition that the plaintiff's plans to develop a hotel and restaurant in an existing business park was consistent with the GEIS, the plaintiff's development plan was assigned mitigation fees of $268,406.[4] In 2016, the plaintiff sued, seeking a refund of the fees paid to the defendant and a declaration that the mitigation fees are illegal.

Procedural History

Plaintiff brought a motion for summary judgment in a suit seeking that the defendant refund the mitigation fees the plaintiff paid it, and a further finding that such fees are illegal.[5] Defendant answered with the affirmative defense that the four-month statute of limitations had run on the plaintiff's case and sought to dismiss the plaintiff's case.[6] The Supreme Court of Saratoga County granted the defendant's motion and dismissed the plaintiff's motion.[7] Plaintiff appealed.[8]

Issue

Whether the Supreme Court abused its discretion in granting the defendant's motion to amend its answer to assert a statute of limitations defense?[9] Additionally, whether the present action was subject to the four-month statute of limitations applicable to CPLR article 78 proceedings or the six-year statute of limitations applicable to declaratory judgment actions?[10]

Rationale

CPLR 3025(b) allows that "[a] party may amend [its] pleading . . . at any time by leave of court."[11] When leave is sought to amend a pleading, "the movant need not establish the merits of the proposed amendment and, in the absence of prejudice or surprise resulting directly from the delay in seeking leave, such applications are to be freely granted unless the proposed amendment is palpably insufficient or patently devoid of merit."[12] Such prejudice exists "where a party has incurred some change in position or hindrance in the preparation of its case which could have been avoided had the original pleading contained the proposed amendment,"[13] but the court clarified that merely delay is not enough cause to deny a motion for leave to amend an answer.[14]

The plaintiff only claims a one-year delay as the prejudice caused by the defendant's motion to amend.[15] Mere delay is not sufficient cause under the CPLR 3025(b) to show the prejudice needed to deny the defendant's motion to amend.[16] Therefore, absent a clear abuse of discretion, the trial court's decision as to whether to grant leave to amend the defendant's pleading should not be disturbed.[17]

Plaintiff's claim that the mitigation fees imposed by the GEIS are illegal is a plain attack on the standard established in the GEIS and SEQRA.[18] The court recognized the GEIS as "an administrative act of defendant's [T]own [B]oard under the circumstances of this case," and that any challenge to such an act should have been the subject of a CPLR article 78 proceeding," which carries with it a four-month statute of limitations.[19] Furthermore, precedent has established that CPLR Article 78 proceedings are the proper vehicle to bring complaints about SEQRA.[20] Although the plaintiff makes a constitutional claim, that claim does not excuse the plaintiff from needing to comply with the Article 78 statute of limitations.[21] Moreover, the plaintiff's request for a refund of mitigation fees is only incidental to the primary relief it asks for and is also subject to the same four-month Article 78 statute of limitations.[22]

Conclusion

The Supreme Court did not abuse its discretion by granting defendant's motion to amend its answer to include a statute of limitations defense.[23] Furthermore, the correct statute of limitations to apply is the four-month statute of limitations for CPLR Article 78 proceedings, as the plaintiff's complaint originated from the results of an administrative act. Since the plaintiff brought the case two months after the Article 78 statute of limitations expired, the plaintiff's complaint was properly dismissed.[24]

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Endnotes

1. NY CLS ECL, Art. 8; *Lakeview Outlets Inc. v. Town of Malta*, 2018 at 1445.
2. *Lakeview Outlets Inc*, at 1445.
3. *Id.* at 1445; *see* 6 NYCRR 617.10.
4. *Id.* at 1445.
5. *Id.*
6. *Id.*
7. *Id.*
8. *Id.* at 1446.
9. *Id.* at 1447.
10. *Id.*
11. CPLR 3025(b).
12. *Lakeview Outlets Inc*, at 1446; CPLR 3025, *reviewed by* James C. Gacioch, Leonard & Cummings, LLP, Leave to Amend, While Freely Given, Nonetheless Requires Showing, David L. Ferstendig ed.
13. *Lakeview Outlets Inc*, at 1446; (quoting *Whalen v. Kawasaki Motors Corp.*, U.S.A., 92 N.Y.2d 288, 293, 680 N.Y.S.2d 435, 703 N.E.2d 246 [1998]).
14. *Lakeview Outlets Inc*, at 1446.
15. *Id.*
16. *Id.*
17. *Id.*
18. *Id.* at 1447.
19. *Lakeview Outlets Inc*, at 1447-1448 (quoting *Trager v. Town of Clifton Park*, 303 A.D.2d 875, 877–878, 756 N.Y.S.2d 669 (2003)).
20. *See, e.g.*, *Matter of Merson v. McNally*, 90 N.Y.2d 742, 754, 665 N.Y.S.2d 605, 688 N.E.2d 479 (1997).
21. *Id,* at 1448.
22. *Id.*
23. *Id.* at 1447.
24. *Id.* at 1449.

The Climate Leadership and Community Protection Act

At the end of New York's 2019 legislative session, lawmakers passed the Climate Leadership and Community Protection Act ("the bill").[1] The bill effectively puts New York at the forefront of the fight against climate change by requiring the state to reduce emissions to 60% of 1990 levels by 2030, and 15% of 1990 levels by 2050.[2] The bill amends the environmental conservation law by adding Article 75, which calls for the establishment of a climate action council and assigns the council specific powers and responsibilities, provides for the promulgation of regulations with the aim of meeting the emissions reduction targets, establishes a climate justice working group, and sets forth standards for the valuation of carbon, air monitoring standards, and implementation reporting.[3]

The bill calls for the establishment of a 22-member climate action council, which will be charged with devel-

oping a plan to achieve the emissions targets through actions such as transportation planning aimed at reducing emissions from motor vehicles, as well carbon sequestration measures.[4] Additionally, the council is charged with convening advisory panels consisting of experts on subjects including transportation, land-use and local government, and power generation.[5] The council is also required to convene a "just transition working group" to study the impacts of this major transition on the state's workforce, such as the number and kind of new jobs that will be created and disruptions to current jobs that would likely result from the closing of energy-production plants.[6]

The bill also mandates the creation of a "climate justice working group" consisting of members from various state agencies (including the Departments of Health and Labor), as well as community representatives from communities of color and communities that have historically borne disproportionate pollution burdens.[7] As noted in the preamble, such a group is necessary since climate change "heightens the vulnerability of disadvantaged communities," and any action to address climate change should therefore "prioritize the safety and health of disadvantaged communities, control potential regressive impacts of future climate change mitigation and adaptation policies on these communities, and prioritize the allocation of public investments in these areas."[8]

The council is required, within two years of the passage of the bill, to produce a scoping plan "outlining the recommendations for attaining the statewide greenhouse gas emissions limits in accordance" with the 2030 and 2050 target dates.[9] The bill provides that the scoping plan will include "regulatory measures and other state actions" such as "[p]erformance-based standards for sources of greenhouse gas emissions" and "[l]and-use and transportation planning measures aimed at reducing greenhouse gas emissions from motor vehicles."[10] The council is also required to update the scoping plan no less than once every five years.[11]

The bill mandates that the Department of Environmental Conservation publish a report at least once every four years including recommendations on the implementation of greenhouse gas reduction measures, including whether or not "the state is on track to meet the statewide greenhouse gas emissions limits" set out by the bill, as well as an "assessment of existing regulations and whether modifications are needed to ensure fulfillment of the statewide greenhouse gas emissions limits."[12]

Finally, the bill requires that all state agencies "assess and implement strategies to reduce their greenhouse gas emissions."[13] In order to do so, it delegates the authority to those agencies to promulgate regulations regarding greenhouse gas emissions limits.[14]

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Endnotes

1. Climate Leadership and Community Protection Act, S. 6599 (Ny. 2019-2020), *available at* https://www.nysenate.gov/legislation/bills/2019/s6599.
2. *Id*. at § 2.
3. *Id*.
4. *Id*.
5. *Id*.
6. *Id*.
7. *Id*.
8. *Id*. at § 1(7).
9. *Id*. at § 2.
10. *Id*.
11. *Id*.
12. *Id*.
13. *Id*. at § 7.
14. *Id*. at § 8.

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