

The New York Environmental Lawyer



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

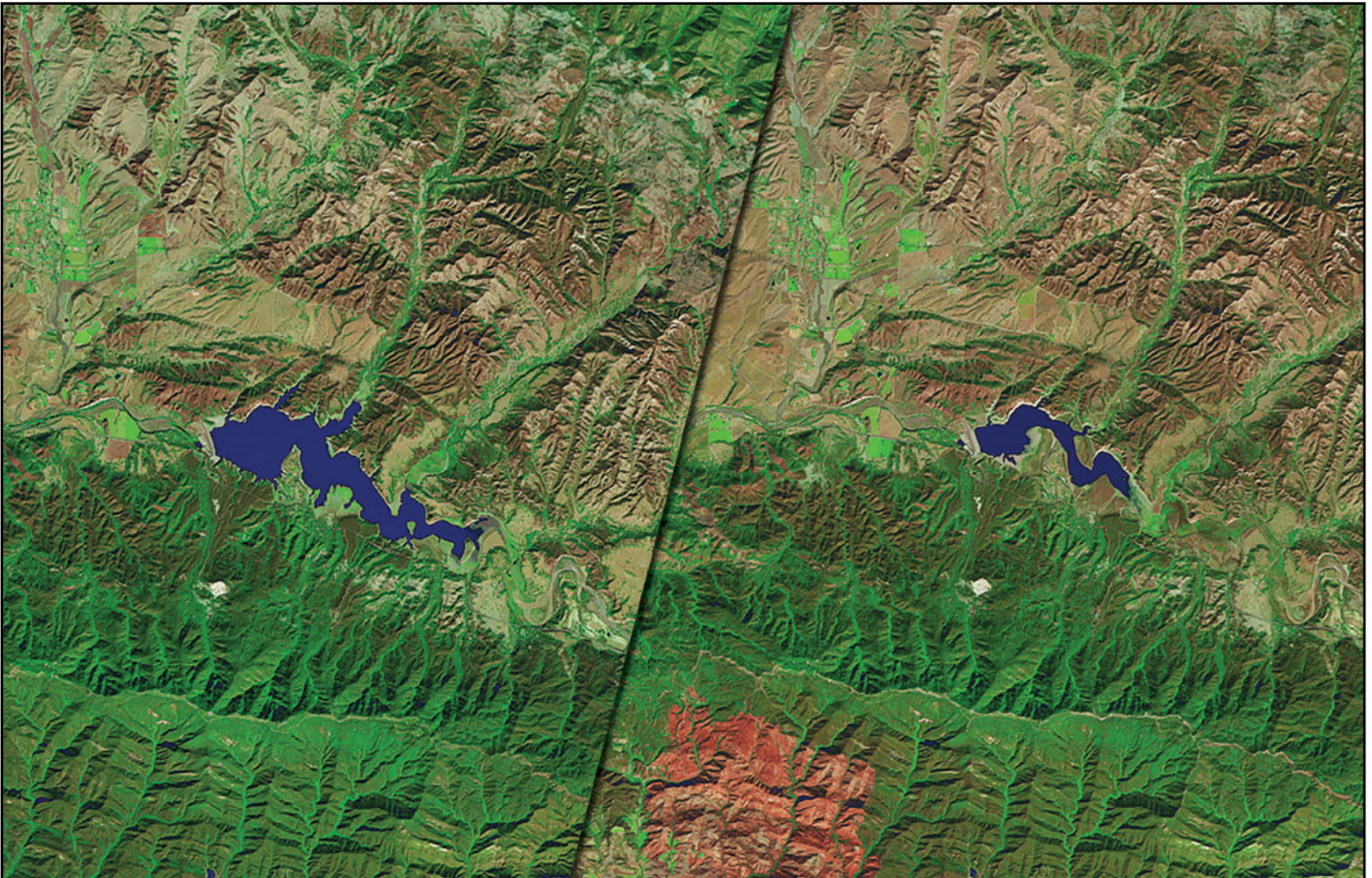


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Inside

- New TSCA Regulations, Risks
- Climate Change Blog: Massive Storms and Renewable Energy Possibilities
- Lessons from Big Tobacco for Big Oil
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October 27, 2013, left, and October 19, 2016, right: The amount of water in Lake Cachuma has fallen to about 7 percent of capacity, the result of a persistent drought in Southern California.

The decline has exposed much of the bottom of the reservoir, which provides drinking water to Santa Barbara. Some 20 percent of the state has suffered exceptional drought, the most extreme drought classification, since early 2014.

Images taken by the Operational Land Imager onboard Landsat 8.

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Message from the Former Chair

I write to report on the State of the Section, at the end of my term as chair of the Environmental & Energy Law Section. I say our name in full mostly because there are some diehards, and you know who you are, who have not fully embraced the “Energy” in our name, even if you embrace the energy with which we try to deal with the new and ever evolving federal environmental and energy paradigm.



As to the name, a change overwhelmingly adopted by our Executive Committee, I believe that if New York State has shown anything since the federal administration changed, it is that energy goals and infrastructure are perfectly intertwined with how we seek to achieve environmental benefits. Our Section, of course, never will be about utility ratemaking and those core utility issues that properly belong to another Section and Committee. However, the Public Service Commission’s Reforming the Energy Vision (REV) is a perfect example of the strategies being undertaken to stimulate investment in clean technologies like solar, wind, energy efficiency, and now energy storage, with the benefit of reducing statewide greenhouse gas emissions. In an April 20, 2018 press release, Governor Cuomo announced an acceleration of energy efficiency targets in New York, with an eye toward meeting the state’s goal of reducing greenhouse gas emissions by 40 percent by the year 2030.

Since the time of my last message, we held a very successful Fall Meeting in Saratoga and our Annual Meeting in New York City. Both meetings had something for everyone. I want to thank the program chairs for each meeting who made it possible—Yvonne Hennessey and Adam Schultz for the Fall Meeting and Kathleen Bennett and Amy Kendall for the Annual Meeting. Plus, as I will mention below, a huge thanks to Marla Wieder and Walter Mugdan for arranging to have Pete Lopez, the EPA Region 2 Administrator, speak at our Annual Meeting.

At the Fall Meeting, in addition to enjoying the beautiful setting of Saratoga Springs, we heard about the ongoing controversies in New York State about siting gas transmission pipelines and the Department of Environmental Conservation’s efforts to prevent the same by denying Water Quality Certifications (it did so again just recently, on April 20, 2018, for the Transco pipeline). During this panel, we heard from both sides and it generated a lot of discussion and disagreement. We also heard from an environmental group, counsel for project proponents, and DEC staff about the 2017 proposed SEQRA amend-

ments. Comments on these proposed regulations were well in hand by the time of the Fall Meeting, and were being considered by the DEC. As it turns out, DEC received more than 250 separate comments, and that resulted in further significant revisions to the SEQRA regulations. As a result, DEC publicly noticed the further revisions to the SEQRA regulations and comments were due on May 4, 2018. Finally, the Fall Meeting gave attendees the opportunity to hear numerous views about the impact of the Trump Administration on federal environmental law and New York’s response. Here, once again, we heard from representatives from the environmental community, the Attorney General’s office, and the DEC.

At our Annual Meeting in New York City, we were guided by program chairs Kathleen Bennett and Amy Kendall. Kathy and Amy put together an excellent program with panels discussing Tribal and Environmental Law, Energy Storage and Distribution (something we are hearing more and more about out of Albany) and New York State’s approach to “Weathering the Storm” in terms of climate change, significant weather events, and resiliency. We also heard about how the Section is continuing in its quest to be more relevant and get our message out through social media (including the Section’s new Twitter account @NYSBAEELS) under the leadership of our Social Media Task Force Chair Meaghan Colligan.

This past year, the Section’s Future of Federal Environmental Policy (FFEP) Task Force has been very active in preparing comments and working with the Bar Association, Section leadership, and the Executive Committee to share the Section’s views about certain activities of the federal government and environmental policy and regulation. In fact, we believe we are the first Section to ever orchestrate a letter from the Bar to the President of the United States. We thank Bar President Sharon Stern Gerstman for showing leadership by putting her name on our letter to President Trump about the United States’ withdrawal from the Paris Agreement. An article about this letter appeared in the November/December edition of *State Bar News*. Most recently, the Section wrote Congressman Tonko to reiterate concerns about proposals discussed this spring to significantly reduce EPA’s FY 2018 budget. Under the leadership of David Freeman, Kevin Healey, and Gail Port, the Task Force continues to be very active in evaluating ongoing regulatory changes at the federal level to determine whether it is appropriate for the Section to share its views. We also want to thank Ron Kennedy of the Bar for working with us to move these very important activities forward.

We hope that the programs the Section offers (like the excellent Basics of Environmental Law offered this spring) and the activities of members of this Section (like those of the FFEP) will encourage those who are

Continued on page 5

Message from the Issue Editor

Asking About Local Environmental Law

Environmental law has always had an uncomfortable relationship with local governance. Can local governments prioritize environmental quality over local economic needs? Local governments are often thought to be too parochial, too focused on competitive advantage, and too driven by fiscal concerns to think objectively about environmental quality. Indeed, in some situations local governments may cater to the demands of new development because of the tax and job benefits that it brings to communities. Can local governments fill in regulatory gaps left in the clean water and air programs? Local governments are thought to lack the sophistication to implement pollution controls, to monitor or regulate toxic exposure, or to enforce emission limitations. Indeed, very few local governments employ the expertise in their staff to implement the types of environmental controls we see at the federal level.

These are fair questions, but they dominate the dialogue on local environmental law in a way that dons blinders. The dilemma we face in assessing local environmental governance is whether we are asking the right questions. From the perspective of local governance ca-



capacity, it is less revealing to determine whether local governments can wield the finances, priorities and expertise necessary to administer the federal regulatory program. Rather, the question of local governance capacity asks how attention to *local* quality of life and other welfare priorities addresses the demands of environmental quality. The dialogue could be fuller, richer, and deeper by considering what environmental law looks like *from the inside* of the community.

Reference to “local” means referencing a place. Environmental conditions in Louisiana differ from those in the Pacific Northwest, in the Rockies, in New Mexico. Different ecosystems function differently in terms of pace and character.

Communities are environmentally situated and grounded. Communities, and the individuals who comprise communities, suffer through, capitalize on, and navigate their surroundings as a way of life. Hazards such as floods, earthquakes and ice storms are relevant, but also are the daily opportunities such as access to productive soils, water, or mineral forestry resources because people do not only survive their local environments—they also live in them. Being ecologically situated means that the environment is the context. The environment is the place where we work, live and play. It is the context for prioritizing and negotiating among competing values through a local lens.

We can understand differently situated communities in light of their contexts. Contextual circumstances influence the development of social and cultural norms, economic priorities, and other resource dependencies. Why? Because communities embrace their surroundings in the unique ways they are situated: some communities prioritize their competitive advantage of local resources, some capitalize on regional resource advantages, and others rely on the non-use values of local ecosystems.

As an outsider, we can look to local environmental governance by counting trees, identifying watershed features, or even map contamination problems. However, it is the community insider who enjoys the benefits of those trees, avoids or engages particular watercourses, or suffers the health and economic impacts of neighborhood contamination.

The potential of local environmental governance is contained in the ways that the environment is understood locally. If the question is changed from the local capacity and drive to implement federal standards to local capacity and drive to protect community assets, cultural priorities, and environmental benefits, we might consider a very different picture of local environmental law.

Message from the Former Chair

Continued from page 4

not members of our Section to join. Reduced membership in the Bar as a whole and in our Section is a source of continuing concern. But there are numerous reasons, some of which are expressed in this message, for there to be renewed interest in our Section. I ask all of you who regularly receive *The New York Environmental Lawyer* to work with us to try to increase our membership and share the benefits of being a part of our great Section.

Finally, I do not think that the Section could have accomplished nearly as much as it did over the past year were it not for Lisa Bataille. Lisa continues to be a guiding force for the Section on an almost daily basis and has helped me enormously. Many thanks to Lisa!

Kevin Bernstein

Keith H. Hirokawa

Message from the Student Editorial Board

Over the past three years, much of South Africa has suffered an unprecedented draught, leading to an undeclared state of emergency in the country. As per a statement released by the Deputy Mayor of Cape Town on February 19, dam levels were at 24.4 percent, the lowest in recent years. The city has instituted water-use restrictions, penalizing residents for water use in excess of 50 liters of water per person per day in an effort to stave off what is being called “Day Zero”—the day when the reservoirs were expected to sink below 13.5 percent capacity and taps around the city are shut off and government dispersal of water begins.

Originally forecast for mid-April, “Day Zero” was pushed back to July 9, 2018, due to a reduction in consumption by residents, the agriculture sector reallocating water from its own reserves, and minimal rainfall. The events in Cape Town and across South Africa, and presumably other water-scarce locations around the world, illustrate both human resiliency and human callousness. While most residents of the city have heard the call to action and reduced their water consumption, others have not.

Answering the call to action, Capetonians came together and decreased their water consumption, yet at the same time there has been refusal by some residents to change their way of life for the greater good. There are rumblings that some wealthy individuals, in a city with already vast wealth inequality, continue to fill their swimming pools and water their lawns. These same individuals plan to augment the decreased access to water by drilling boreholes or purchasing water at a high cost from online sellers.

Could this situation have been avoided? The government of South Africa has been criticized for its reliance

on reservoirs and dams—sources notoriously susceptible to draught—and the lack of access to aquifers and other sources of water, especially among the nation’s poorest residents. In a rush to push back “Day Zero,” the government of Cape Town began expediting construction on desalinization plants it planned to open by 2020, and continues to look for other methods to avoid crisis.

One lesson we might learn from the crisis facing Cape Town involves the use of social media to educate the citizenry and push them to change. “Day Zero” was created to bring attention to the water shortage facing the city and the dire results that could face the city if paradigmatic changes did not occur. While there has been resistance from some residents and Cape Town has not yet met its water-use goal, this movement has largely been successful as the city cut water consumption by more than 130 million gallons a day. “Day Zero” created a timeline for the residents of the city to acknowledge and was an impetus for change, which would not have been possible if it were not for social media attention.

Additionally, the city used social media to host a #DEFEATDAYZERO event intended to bring individuals together and create innovative solutions to conserve and find water. As a way of communicating with residents, the city took to Twitter to push water conservation and educate the residents on the environmental and health effects associated with water scarcity—using the platform in a constructive manner. Social media can and should have a large role in environmental communication, as exemplified by the results in Cape Town, to bring attention to the issues facing society and the environment in modern times.

Suzanne Foote
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NEW YORK STATE BAR ASSOCIATION

REQUEST FOR ARTICLES

If you have written an article you would like considered for publication, or have an idea for one, please contact the Editor-in-Chief:

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



Outside the EPA Update

By Jay Simpson

Regular readers of this piece may notice that I'm not Marla, Joe, Mary, or Chris. Rather, they are all my former colleagues at EPA Region 2. I have agreed to take the reins for these EPA updates during their hiatus. It should not take a red team/blue team scientific debate to determine that four EPA staffers are more than one former staffer. Nevertheless, while I will do my best to be as comprehensive as possible, this column does not presume to cover everything happening at EPA Region 2 or EPA generally.

This column will cover changes at EPA through 2017. It will discuss first the transition at EPA, including the Back to Basics agenda, repeal of rules and regulations, new regional administrators, changes to SEPs, and Pruitt's "Sue and Settle" directive. Second, the column discusses EPA's important hurricane response work. Third, the column discusses climate change and the Trump administration's efforts to reverse work done during the Obama administration, including the Paris Agreement and the Clean Power Plan. Fourth is a discussion of Superfund, including new additions to the NPL and updates for the Gowanus Canal and the Hudson River cleanup. Fifth is a discussion of the new administration's efforts to undue the 2015 Waters of the United States Rule. Lastly, the column discusses enforcement.

I. Transition at EPA

In case anyone has been asleep at the switch, changes are afoot at EPA. Administrator Scott Pruitt assumed his position early in 2017. In his first speech to EPA employees on February 21, 2017, he announced three general principles that would guide his administration: "process matters," "cooperative federalism," and "rule of law." As examples, he cited his desire to not make guidance documents carry the force of regulations, and not let consent decrees bypass the Administrative Procedure Act.

"Back to Basics" Agenda

Early in his tenure Pruitt announced his "Back to Basics" agenda. Notably, Pruitt made this announcement at a coal mine. According to EPA's website, the agenda seeks to "refocus EPA on its intended mission."¹ EPA explains this agenda focuses on three Es: Environment, Economy, and Engagement. EPA wants to protect the environment with sensible regulations that allow for economic growth, while engaging with state and local partners. Implicit in Pruitt's announcement and his comments on climate change (or lack thereof), Pruitt views Back to Basics as shifting EPA away from addressing climate change.

Broad Repeal or Delay of Obama Administration Regulations

Pruitt has not been shy about his desire to reverse what he considers ill-conceived regulations promulgated under the Obama Administration, particularly those that

target greenhouse gases or impact fossil fuel industries. The number of regulations targeted for review, delay, or repeal is unprecedented in EPA history.

One commentator, a former EPA Deputy Administrator, identified at least 30 such rules (as of November 1, 2017), among them are:

- Clean Power Plan
- New source performance standards (NSPS) for greenhouse gas (GHG) emissions from steam-electric generating units
- Clean Water Rule or "Waters of the United States" Rule
- 2016 NSPS for methane and volatile organic compounds (VOCs) emissions from oil and gas operations
- 2012 GHG emissions standards for light-duty vehicles
- Effluent limitation guidelines for steam-electric power plants
- Disposal and waste management requirements for power plant coal ash residuals
- Farmworker Protection Standard
- Texas Regional Haze Requirements
- National emission standards for hazardous air pollutants (NESHAP) for manufacture of amino/phenolic resins
- Mercury and air toxics standards (MATS)
- Risk Management Plan (RMP) Rule (chemical safety rule)
- Landfill Methane Rule
- Air toxics rules for brick and clay production sector
- Trailer requirements in heavy-duty truck and engine GHG emissions rules
- Certification requirements for pesticide applicators²

These aren't the only rules the new administration has targeted. On March 29, 2017, Pruitt, in one of his first major actions, rejected a decade old petition to ban the insect

Any opinions expressed herein are the author's own, and do not necessarily reflect the views of the U.S. Environmental Protection Agency. This Update is based on select EPA press releases available at <http://www.epa.gov/newsroom>, and other public information covering approximately February 1, 2017 through December 6, 2017.

ticide chlorpyrifos (also known as Lorsban) despite EPA's risk analysis that found the compound posed a risk to fetal brain and nervous system development.³ EPA banned household use of this insecticide in 2000; today, around 40,000 farms use it on a wide variety of crops. Pruitt argued the chemical needed further study and disagreed with the scientific methodology the previous administration used.⁴

In addition, on March 2, 2017, Pruitt canceled an EPA information request sent to the oil and gas industry for information related to methane and VOC emissions, which EPA had issued on November 6, 2016.⁵ Pruitt canceled the rule the day after attorneys general from 11 states wrote a letter to Pruitt, claiming the rule added unnecessary costs and paperwork for oil and gas companies.⁶

On November 9, 2017, Pruitt proposed to repeal application of the Medium- and Heavy-Duty Truck Phase II Greenhouse Gas Emission and Fuel Efficiency Standards for the glider industry (gliders are a special type of heavy duty truck), and opened the issue for public comment.⁷

Challenges to EPA Delaying Rules

Pruitt's actions regarding not just revoking rules but also delaying certain rules has not gone unnoticed. Environmental groups and others have sued EPA for delaying rules, often arguing a violation of the "rule of law," namely the Administrative Procedure Act. To date, courts seem to be siding with the challengers to these delays, and in others the public pressure has forced Pruitt to reverse course.

In one action, on June 28, 2017, Pruitt delayed by one year the compliance deadline for promulgating initial area designations for the new eight-hour ozone NAAQS.⁸ After 15 states and the District of Columbia sued, the following day Pruitt reversed course and stuck to the original deadline.⁹ Pruitt's statements in EPA's press release announcing the reversal foreshadowed his "sue and settle" directive.¹⁰

In *Clean Air Council v. Pruitt*, the D.C. Circuit vacated EPA's administrative stay of portions of the methane regulations in the New Source Performance Standards for the Oil and Natural Gas Sector.¹¹ EPA sought to stay judicial review and issued a temporary stay of the prior rule pending the agency's reconsideration of those methane regulations. The court held, however, that EPA failed to comply with the requirements for reconsideration and stay per Clean Air Act § 307(d)(7)(B) and therefore that the agency's action was invalid.

In another example of courts frowning on EPA trying to delay legal obligations, the Northern District of California denied EPA's motion for relief from a consent decree.¹² EPA tried to extend indefinitely a consent decree's deadline to approve or disapprove of Delaware's proposed SIP changes to meet the ozone NAAQS. EPA asked the court to hold the deadline in abeyance while the new administration completed its review of EPA final action regarding

emission controls during start-up, shutdown, and malfunction of stationary sources (SSM). The court noted the SSM rule is currently under judicial review in the D.C. Circuit. EPA argued that the outcome of the Delaware SIP decision could depend on its policy review of the SSM rule. The court swept aside EPA's arguments and summarized: "EPA's decision to consider changing a related regulatory policy, at some point in the future, cannot excuse its failure to comply with its statutory duties and the judgment of the court." Slip Opinion at 5.¹³

EPA Launches Smart Sectors Program—Long-Term Regulatory Planning with Industry

On September 26, 2017, EPA announced the Smart Sectors program in the Office of Policy. According to EPA this new program "will re-examine how EPA engages with industry in order to reduce unnecessary regulatory burden, create certainty and predictability, and improve the ability of both EPA and industry to conduct long-term regulatory planning while also protecting the environment and public health."¹⁴ This is intended as a partnership between EPA and regulated sectors.¹⁵

Meet the Regional RAs!

EPA announced the appointment of EPA Regional Administrators for Regions 1, 2, and 3 in fall 2017. Alexandra Dunn became Regional Administrator for EPA Region 1, Pete Lopez the Regional Administrator for Region 2, and Cosmo Servidio the Regional Administrator for Region 3. RA Dunn may be familiar to some as a former head of the environmental program at the Elisabeth Haub School of Law at Pace University, and a former chair of the American Bar Association's section of Environment, Energy, and Resources (SEER). RA Lopez served in the New York State Assembly for a decade and was active on the environmental committee. RA Servidio was director of environmental affairs for the Bucks County Water and Sewer Authority in Pennsylvania, one of the state's largest water and wastewater utilities. All three appointments received accolades from a diverse array of stakeholders.

SEPs On Their Way Out?

While not EPA action, the DOJ change in policy regarding supplemental environmental projects (SEPs) may well impact future settlements with the Agency. Attorney General Jeff Sessions' June 5, 2017 memo prohibits the practice of allowing a party to direct a portion of a settlement penalty to a supplemental environmental project.¹⁶ There are some limited exceptions; for example, the policy does not apply to a lawful payment that provides restitution to a victim or that directly remedies the harm redressed, including environmental harm.

According to EPA's SEP policy, a SEP is an environmentally beneficial project or activity that is not required by law, but that a defendant agrees to undertake as part of a settlement of an enforcement action.¹⁷ SEPs go beyond what could legally be required in order for the defendant

to return to compliance, and secure environmental and/or public health benefits beyond those achieved through compliance. The primary purpose of EPA's SEP policy is to encourage environmental and public health benefits that may not otherwise have occurred when settling an enforcement action.¹⁸ Whether EPA will continue using SEPs in a limited fashion remains to be seen.

In the past, SEPs have been very useful and beneficial for EPA settlements. For example, earlier in 2017 Volkswagen Companies settled lawsuits with the federal government for using defeat devices to cheat on emissions tests.¹⁹ This included \$2 billion that Volkswagen agreed to invest in electric vehicle charging infrastructure and promotion of electric vehicles as part of a SEP. The settlement also directs Volkswagen to establish \$2.7 billion trust fund for all 50 states and Puerto Rico for programs that would reduce NOX pollution from diesel cars and trucks.²⁰ Rather than having a monetary penalty paid solely to the U.S. Treasury, here, the VW settlement directed a portion of the penalty to redress the environmental harm the violations caused.

EPA's "Sue and Settle" Directive

On October 16, 2017, Pruitt issued a "Directive Promoting Transparency and Public Participation in Consent Decrees and Settlement Agreements."²¹ This directive seeks to put an end to "sue and settle," the process whereby certain entities sue EPA for violating statutory deadlines or other statutory violations and EPA and the entity enter into a consent decree to resolve the issue. More often than not, these consent decrees contain provisions that put the Agency on a schedule to follow through on a missed deadline or otherwise resolve other violations of law. In Pruitt's words, "[t]he days of this regulation through litigation, or 'sue and settle,' are terminated," in an affirmative use of the passive voice.²² The directive went so far as to allege "collusion" between EPA and unnamed outside groups when EPA resolved lawsuits filed against it through a consent decree.²³

The directive establishes procedures for EPA to follow in the consent decree and settlement process regarding lawsuits filed against EPA. These include publishing online notices of intent to sue, and the complaint when received; EPA notifying affected states and/or regulated entities and seeking their concurrence before entering a CD; EPA establishing an online searchable list of CDs and settlement agreements that continue to govern Agency actions; and posting online for public comment and review all proposed CDs lodged in federal court, including posting a notice of the same in the Federal Register. This last provision is a big departure from past practice, aside from Clean Air Act CDs, and may invite delay as otherwise unaware interested parties weigh in on the merits of the CD. Interestingly, Pruitt reserved the right to exercise his own discretion and allow EPA to deviate from this directive "where appropriate."²⁴

Pruitt's memorandum accompanying the directive elaborates on the three fundamental principles he outlined in his inaugural speech to EPA staff: due process, rule of law, and cooperative federalism. Pruitt's memo cites a dissenting opinion from the DC Circuit to support his argument.²⁵

Learn more about the directive here: <https://www.epa.gov/newsroom/multimedia-administrator-scott-pruitts-directive-end-epa-sue-and-settle>.

EPA's FY2018-2022 Strategy

EPA announced its draft strategic plan on October 5, 2017, and accepted public comments on it until October 31, 2017.²⁶ EPA announced three goals in the plan: (i) Core Mission; (ii) Cooperative Federalism, and (iii) Rule of Law and Process. A summary of the plan is available here: <http://www.4cleanair.org/sites/default/files/Documents/EPA-Transformation-Strategy-at-a-Glance-20170927.pdf>.

Solar Power at EPA Region 2's Edison Labs

As of October 25, 2017, EPA Region 2 has installed 4,788 photovoltaic panels at its Edison, New Jersey campus.²⁷ The solar array will generate enough electricity to power 45% of the campus' electrical demand. The new system is rated at a peak capacity of 1.5 megawatts and is expected to produce a total of two million kilowatt hours of electricity in its first year of operation.²⁸ The solar panels will operate year-round, and were installed with considerations for snowfall and shading from nearby structures. During periods when the panels generate excess energy (e.g., weekends), the excess will flow back to the grid and the local utility will credit EPA for the excess power generated.

Hurricane Response

EPA was very active in its responses to Hurricanes Harvey, Irma, and Maria, focusing on environmental impacts and potential threats to human health as well as the safety of those in the affected areas. For EPA Region 2, addressing the impacts to Puerto Rico and the U.S. Virgin Islands (USVI) have been of particular concern. EPA has set up a website devoted to its Hurricane Maria response: www.epa.gov/hurricane-maria

As of November 20, 2017, about 332 EPA personnel were involved in hurricane response efforts, including 97 EPA personnel on the ground in USVI and 142 EPA personnel in Puerto Rico to assist with response efforts.²⁹

Hazardous Debris

Not surprisingly, hurricanes generate vast amounts of debris, including some that is considered hazardous waste. EPA reported it is assisting agencies to manage debris, and the handling and disposal of household hazardous waste, oil, chemical, medical, and electronic wastes.³⁰

An important aspect of EPA's hurricane response is identifying, opening and operating collection areas for hazardous materials as part of its cleanup efforts.³¹ EPA has been providing information to the public about hazardous household waste segregation, drop-off and/or collection to residents through flyers, public service announcements over radio, and direct interaction by EPA personnel at heavily frequented locations such as shopping centers.³²

On December 6, 2017, EPA announced it was still working with local governments and residents in St. Croix, St. Thomas, St. John, and Water Island, U.S. Virgin Islands to keep hazardous materials out of the environment and minimize the amount of waste going to landfills through household hazardous waste collection events.³³ "As part of our continuing response to Hurricanes Irma and Maria, we want to protect people and their families from potential dangers of hazardous items such as batteries, motor oil, old paint and pesticides," said EPA Regional Administrator Pete Lopez.³⁴ "These items can pose a threat to people and to the environment, so it's important that they are disposed of properly. EPA's goal is to help residents protect themselves and their community by separating potentially hazardous products from their regular trash."³⁵

In Puerto Rico, EPA and the U.S. Army Corps of Engineers opened 20 collection locations for household hazardous waste, electronic waste, orphan containers, and white goods such as large appliances and air conditioners; EPA established seven locations in the USVI.³⁶ As of November 22, 2017, EPA had collected 7,636 containers of hazardous materials in Puerto Rico and more than 4,909 containers of hazardous materials in the USVI.³⁷ Since late October 2017, EPA had shipped more than six tons of stockpiled medical waste from St. Croix's Governor Juan F. Luis Hospital and Medical Center for proper disposal off the island.³⁸ In St. Thomas, at the Schneider Regional Medical Center, more than 29 tons of medical waste were properly packaged and awaiting shipment for disposal.³⁹

EPA also worked with the U.S. Coast Guard to recover vessels in Puerto Rico and the USVI. Working with other agencies, EPA is lending its expertise to assist with the disposal of recovered oil, batteries and hazardous materials. As of November 22, 2017, EPA and the U.S. Coast Guard had assessed 344 vessels in Puerto Rico. In the USVI 448 vessels had been assessed.⁴⁰

Assessment of Superfund Sites, Oil Sites and Regulated Facilities

EPA completed preliminary damage assessments at EPA-led Superfund sites, oil sites, and chemical facilities in both Puerto Rico and the U.S. Virgin Islands to determine if the sites were affected by Hurricane Maria, and is conducting follow-up actions, such as securing the site fence and other structural repairs.⁴¹ In addition, EPA is coordi-

nating with the lead federal agencies responsible for two other sites, Culebra and Vieques.⁴²

EPA teams have assessed 285 fixed facilities in Puerto Rico and 91 in the USVI that are regulated under the Risk Management Plan (RMP), Facility Response Plan (FRP), or Spill Prevention, Control, and Countermeasure (SPCC) programs.⁴³ EPA identified no major spills or releases from these facilities.

Drinking Water and Wastewater Management

EPA announced it continues to assess the conditions of drinking water, including sampling and analysis.⁴⁴ EPA is also assisting federal, state and local agencies to assess and identify needed repairs to wastewater conveyance and treatment systems. The Puerto Rico Aqueduct and Sewer Authority (PRASA) and the Puerto Rico Department of Health continue to monitor drinking water quality to ensure that PRASA's drinking water supplies meet local and federal drinking water standards.⁴⁵ EPA completed its initial evaluations of non-PRASA drinking water systems in mid-October and continues to support a FEMA Water Task force to bring all of Puerto Rico's drinking water systems to pre-storm conditions.⁴⁶

As of November 20, EPA completed 1,339 drinking water assessments in the USVI. EPA is continuing to sample drinking water systems identified by DPNR in St. Croix. EPA will continue to coordinate with DPNR to prioritize drinking water facilities to be assessed and sampled.⁴⁷

The damage done in Puerto Rico from Hurricane Maria was substantial. For example, more than one-third of wastewater treatment plants PRASA services were out of service after the hurricane.⁴⁸ PRASA services 96 percent of the population in Puerto Rico. Five sewer trunks collapsed and a number of main trunk sewer lines were washed away during flash floods, causing raw sewage to enter waterways, including major rivers like the Rio Grande de Loiza, as well as other streams and coastal waters.⁴⁹

Climate Change

At Least We Had Paris?

It's a new era at EPA regarding climate change. Whereas EPA Administrator Gina McCarthy made climate change a priority of her administration, for Pruitt, not so much. Pruitt's hostility to climate regulations is well known; indeed, Pruitt's "Back to Basics" approach is an implicit shift away from addressing climate change.

President Trump's Executive Order Targeting Climate Regulations

President Trump asserted himself early and forcefully in the climate arena with his lengthy March 28, 2017 Executive Order "Promoting Energy Independence and Economic Growth" ("Trump Energy E.O.").⁵⁰ President Trump signed the Trump Energy E.O. in a ceremony at EPA Headquarters. The Trump Energy E.O. announced

a new policy “to promote clean and safe development of our Nation’s vast energy resources, while at the same time avoiding regulatory burdens that unnecessarily encumber energy production, constrain economic growth, and prevent job creation.”⁵¹ This E.O. targets all federal regulations and policies that “potentially burden the safe, efficient development or use of domestically energy resources, with particular attention to oil, natural gas, coal, and nuclear energy resources.”⁵² The E.O. also revoked and rescinded several Obama Administration actions addressing climate change including: Executive Order 13653 of November 1, 2013 (Preparing the United States for the Impacts of Climate Change); Presidential Memorandum of June 25, 2013 (Power Sector Carbon Pollution Standards); The Report of the Executive Office of the President of June 2013 (The President’s Climate Action Plan); and The Report of the Executive Office of the President of March 2014 (Climate Action Plan Strategy to Reduce Methane Emissions).⁵³ Trump’s Energy E.O. also ordered CEQ to rescind its final guidance regarding greenhouse gases and climate change impacts in NEPA reviews.

Trump’s Energy E.O. ordered Pruitt to review the Clean Power Plan in accordance with the new policy announced above, including suspending, revising, or rescinding any rules or guidance issued under it (i.e., the greenhouse gas NSPS for new power plants and the carbon guidelines for existing power plants).⁵⁴ Trump’s Energy E.O. also disbanded the Interagency Working Group on the Social Cost of Greenhouse Gases, and withdrew several documents issued by it.⁵⁵

EPA to Review the Clean Power Plan Under President Trump’s Executive Order

The same day as the Trump Energy E.O. signing ceremony, EPA announced it would review the Clean Power Plan.⁵⁶ A few days later, Pruitt sent a letter to state governors stating they were under no obligation to adhere to the Clean Power Plan.⁵⁷

President Trump to Withdraw from Paris Agreement

True to his campaign promise, on June 1, 2017, President Trump announced he will withdraw the U.S. from the Paris Agreement.⁵⁸ Withdrawal is not immediate. Per Article 28 of the Paris Agreement, the earliest date the U.S. can withdraw is November 4, 2020, the day after the 2020 presidential election. On August 4, 2017, the U.S. State Department submitted notice of the U.S. intent to withdraw from the Paris agreement as soon as it is eligible, but also announced the U.S. would continue to participate in international climate change negotiations and meetings, including COP-23 (the 23rd Conference of the Parties to the UN Framework Convention on Climate Change).⁵⁹

United States Only Nation Not in Paris Agreement—Syria and Nicaragua Join

Nicaragua joined the Paris Agreement early in 2017 (Nicaragua was holding out for a stronger agreement).

Syria announced its intent to ratify the Paris Agreement, leaving the United States as the only nation on the face of the Earth not to participate in the Paris Agreement.⁶⁰

Pruitt Explains Why United States Left Paris Agreement

After the announcement to exit the Paris Agreement, Pruitt explained the decision during media appearances.

“Willie Geist: You’ve seen reaction around the world to the withdrawal from the Paris Agreement. It hasn’t been kind from our allies, it hasn’t been kind from a lot of people here in the United States. Could you just summarize for our viewers the decision that was made to pull out and why we did it?”⁶¹

“Administrator Pruitt: “When you look at what was agreed to in Paris, it put this country, our country at a disadvantage economically; despite the fact that we had taken several significant steps since the early-1990s with respect to reducing the CO2 footprint, we’re at pre-1994 levels with our CO2 footprint. From 2000 to 2014, we reduced CO2 emissions by 18-plus percent. We’ve been leading by action, in my estimation. What Paris represented was a commitment to achieve things that were unachievable. The previous administration, with every step they took in their climate action agenda, still fell 40 percent short of those 26 to 28 percent targets. What the decision was about was simply sending the message we’re leading with action, not with words. We’re going to make sure we put America first with respect to these decisions and continue to export our innovation and technology to the rest of the world with respect to how to reduce the CO2 footprint.”⁶²

EPA Proposes to Repeal Clean Power Plan

On October 10, 2017, EPA issued a Notice of Proposed Rulemaking, proposing to repeal the Clean Power Plan (CPP).⁶³ EPA announced it had reviewed the CPP per Trump’s Energy E.O. and determined that the Obama-era regulation exceeds the Agency’s statutory authority.

“The Obama administration pushed the bounds of their authority so far with the CPP that the Supreme Court issued a historic stay of the rule, preventing its devastating effects to be imposed on the American people while the rule is being challenged in court,” said EPA Administrator Scott Pruitt.⁶⁴

According to EPA, the CPP was “issued pursuant to a novel and expansive view of authority under Section 111 of the Clean Air Act (CAA). The CPP required regulated entities to take actions ‘outside the fence line.’”⁶⁵ EPA stated that because “the CPP departed from this traditional limit on EPA’s authority under an ‘inside the fence line’ interpretation, EPA is proposing to repeal it.”⁶⁶

On October 16, 2017, EPA officially proposed to repeal the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (i.e., the CPP), as promulgated on October 23, 2015.⁶⁷ This proposal

originally had a 60-day public comment period that EPA extended 32 days to January 18, 2017.⁶⁸

EPA Issues Rule to Reduce HFCs, Consistent with the Kigali Amendment

Early EPA Update columns reported that EPA was already doing its part to reduce HFCs here at home before the Kigali Amendment to the Montreal Protocol. On July 21, 2017, EPA published a final rule, a “determination of acceptability” (Determination 33),⁶⁹ which expands the list of acceptable substitutes under EPA’s Significant New Alternatives Policy (SNAP) pursuant to Section 612 of the Clean Air Act.⁷⁰ This action lists as acceptable additional substitutes for use in the refrigeration and air conditioning sector and the cleaning solvents sector.⁷¹ While the global warming potentials of the blends are significant, they are much lower than or comparable to existing HFCs already in use as substitutes to ozone depleting substances.

Superfun! [sic] Update

EPA Adds Saint-Gobain Performance Plastics Site in Hoosick Falls, N.Y. to the NPL

In late July 2017, EPA added the Saint-Gobain Performance Plastics site in the Village of Hoosick Falls, N.Y. to the Superfund National Priorities List (NPL) of the country’s most hazardous waste sites.⁷² Groundwater at the Saint-Gobain Performance Plastics facility, located at 14 McCaffrey Street, and in other locations in Hoosick Falls is contaminated with Perfluorooctanoic Acid (PFOA) and Trichloroethylene (TCE).

The McCaffrey Street facility was built in 1961 and had been used to manufacture circuit board laminates, polytetrafluoroethylene (PTFE)-coated fiberglass and other PTFE products. In 1999, Saint-Gobain Performance Plastics purchased the facility and began operations there, using PFOA in its manufacturing process. PFOA belongs to a group of chemicals used to make household and commercial products that resist heat and chemical reactions and repel oil, stains, grease and water. PFOA was widely used in non-stick pots and pans, stain-resistant carpets, and water-resistant outerwear. In 2006, the EPA reached a nationwide agreement with eight manufacturers to phase out the production and use of PFOA. These manufacturers stopped using PFOA in 2015. PFOA is persistent in the environment and can pose adverse effects to human health and the environment. TCE is a volatile organic compound widely used as an industrial solvent. Exposure to TCE can have adverse health impacts, including liver damage and increased risk of cancer.⁷³

The EPA is coordinating all investigation and cleanup efforts with New York State.

EPA Adds Battery Smelter Facility in Arecibo, Puerto Rico to the NPL

In late July 2017, EPA also added a former battery recycling facility in Arecibo, Puerto Rico to the NPL.⁷⁴ As

a result of previous operations, the site is contaminated with lead, arsenic and heavy metals. Before it temporarily stopped operating in the spring of 2014, The Battery Recycling Company, Inc. smelted lead batteries into lead ingots, which are bars of lead that can be reused in manufacturing.⁷⁵ In the process of smelting the lead batteries, The Battery Recycling Company, Inc. generated large quantities of waste, including lead slag and lead-contaminated dust. Workers also carried lead dust on their clothes into their cars and homes, putting their families and others potentially at risk.

Dredging Pilot at Gowanus Canal Superfund Site in Brooklyn, N.Y. to Begin

On September 29, 2017, EPA announced that its dredging and capping pilot project began as part of its overall cleanup of the Gowanus Canal Superfund site in Brooklyn, New York.⁷⁶ EPA expects to dredge and remove approximately 22,000 cubic yards of contaminated sediment in the Gowanus Canal’s Fourth Street Turning Basin (located at the intersection of Fourth Street and Third Avenue). The project includes installation of steel sheeting to support existing bulkheads during the pilot project. EPA will also monitor air and water during this project. Work is expected to continue through the spring of 2018. EPA is cooperating closely with New York State throughout this work.⁷⁷

More than a dozen contaminants, including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and heavy metals such as mercury, lead and copper, were found at high levels in the Gowanus Canal sediment. PAHs and heavy metals were also found in the canal water. EPA has divided the Gowanus Canal cleanup into three segments that correspond to the upper, middle, and lower portions of the canal. The first segment, which runs from the top of the canal to the Third Street Bridge, and the second segment, which runs from Third Street to just south of the Hamilton Avenue bridge, contain the most heavily contaminated sediment. In the third segment, which runs from the Hamilton Avenue Bridge to the mouth of the canal, the sediment is less contaminated.⁷⁸

For the first and second segments of the canal, EPA’s plan requires dredging of approximately 307,000 cubic yards of highly contaminated sediment. In addition, in areas of the deep sediment that are contaminated with liquid coal tar, which bubbles up toward the surface, the sediment will be stabilized by mixing it with cement or similar binding materials. The stabilized areas will then be covered with multiple layers of clean material, including an “active” layer made of a specific type of absorbent material that will remove PAH contamination that could well up from below, an “isolation” layer of sand and gravel that will ensure that the contaminants are not exposed, and an “armor” layer of heavier gravel and stone to prevent erosion of the underlying layers from boat traffic and currents. Finally, clean sand will be placed on top of the “armor” layer to restore the canal bottom as a habitat.⁷⁹

For the third segment of the canal, EPA requires the dredging of approximately 280,000 cubic yards of contaminated sediment and capping of the area with active, isolation, and armor layers and a layer of sand to help restore habitat. The plan also requires removing contaminated material placed in the First Street turning basin of the canal decades ago and restoring approximately 475 feet of the former basin. In addition, EPA is requiring the excavation and restoration of the portion of the Fifth Street turning basin beginning underneath the Third Street Bridge and extending approximately 25 feet to the east of the bridge.⁸⁰

EPA Released Second Five-Year Review of Hudson River PCB Cleanup

On June 1, 2017, EPA released for public comment its second review of the historic cleanup of PCB-contaminated sediment from the upper Hudson River.⁸¹ EPA's second five-year review was the culmination of an eleven-month evaluation process which included collecting new data, conducting an objective analysis of project activities and a quantitative analysis of all available fish, water and sediment data. The more than 1,000-page report includes a detailed technical assessment and various technical data evaluations as appendices. The five-year review acknowledges that as many as eight or more years of post-dredging fish data may be needed to establish, with a high degree of confidence, a long-term statistical trend in levels of PCBs in the fish.

The EPA's two-part cleanup plan called for the targeted environmental dredging of approximately 2.65 million cubic yards of PCB-contaminated sediment from a 40-mile stretch of the Upper Hudson River between Fort Edward and Troy, N.Y., followed by a period of monitored natural recovery. Dredging began in 2009 and was completed in 2015. It was one of the largest and most logistically complex environmental dredging projects ever undertaken in the U.S., and resulted in the removal of about 2.75 million cubic yards of PCB-contaminated sediment. Approximately 310,000 pounds of PCBs were permanently removed from the river—twice the mass anticipated—representing an estimated 72 percent reduction in the overall mass of PCBs in the Upper Hudson River.⁸²

According to EPA, average PCB concentrations in fish in the Upper Hudson are declining but have not yet reached protective levels. When EPA made its cleanup decision in 2002, the agency predicted that it would take years after dredging is completed for PCB levels in fish to reach levels where the existing fish consumption advisories may begin to be relaxed, and decades before fish can safely be eaten frequently. As a result, the fish consumption advisories are a necessary component of the site remedy. Since 1976, high levels of PCBs in fish have led New York State to close various recreational fisheries and to issue advisories restricting the consumption of fish caught in the Hudson River.⁸³

EPA states that as the process continues, human exposure to PCB-contaminated fish will continue to be controlled through fishing restrictions and fish consumption advisories issued by New York State. EPA set interim targets for the reduction of PCBs in fish tissue that would allow New York State to adjust the advisories and loosen the restrictions over time. The New York State Department of Health (NYSDOH) controls adjustments to the advisories. Hudson River-area residents who eat fish are encouraged to closely review and adhere to the advisories set by New York State. The five-year review includes a discussion of some of the efforts New York State has taken to improve the effectiveness of the advisories. EPA will continue to work closely with the New York State Department of Environmental Conservation and NYSDOH to improve their fish advisory outreach program.⁸⁴

Water Quality

"Waters of the United States"—President Trump's Executive Order

The new administration started quickly in efforts to reverse EPA and the Army's 2015 rule defining "Waters of the United States" (WOTUS) under the Clean Water Act.⁸⁵ On February 28, 2017, President Trump signed an Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States' Rule."⁸⁶ The E.O., in Section 1, declares: "Policy. It is in the national interest to ensure that the Nation's navigable waters are kept free from pollution, while at the same time promoting economic growth, minimizing regulatory uncertainty, and showing due regard for the roles of the Congress and the States under the Constitution."⁸⁷ It's interesting to compare this new policy from the executive branch with Congress' express objective of the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."⁸⁸ Congress also declared specific goals and policies, none of which discuss promoting economic growth, except for Federal financial assistance to construct publicly owned treatment works (POTWs).⁸⁹ In terms of Federalism, Congress has already stated, in the context of water resources, that "Federal agencies shall co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources."⁹⁰

President Trump's E.O. requires review of the WOTUS rule for consistency with this new policy, and to propose to revise or rescind the WOTUS rule accordingly.⁹¹ Among other things, the E.O. also requires that the in future rulemaking EPA and the Army Corps "shall consider interpreting the term 'navigable waters,' as defined in 33 U.S.C. 1362(7), in a manner consistent with the opinion of Justice Antonin Scalia in *Rapanos v. United States*, 547 U.S. 715 (2006)."⁹²

EPA Announces Intent to Replace WOTUS

Following the E.O. by May 9, 2017, EPA apparently completed the E.O.'s required review and announced a two-step process to develop a replacement WOTUS rule.⁹³ According to EPA this two-step process will provide certainty to the public and the regulated community during the development of a replacement rule.

According to EPA,

the first step is to revise the Code of Federal Regulations to re-codify the definition of 'Waters of the United States' which currently governs administration of the Clean Water Act, in light of a decision by the U.S. Court of Appeals for the Sixth Circuit staying a definition of 'Waters of the United States' promulgated by the agencies in 2015. This action will simply make the text of the Code of Federal Regulations reflect the definition currently in effect under the Sixth Circuit stay. This action, when final, will not change current practice with respect to the how the definition applies, which is consistent with Supreme Court decisions, agency guidance documents, and longstanding practice.⁹⁴

The EPA continues that the second step will be a public notice-and-comment rulemaking involving a substantive reevaluation and revision of the definition of "Waters of the U.S." in accordance with Trump's Energy E.O.⁹⁵

On May 9, 2017, EPA solicited input from state governors on a new definition of "navigable waters" that "is in-line with a Supreme Court Justice Antonin Scalia's opinion in the 2006 *Rapanos v. United States* case. Scalia's definition explains that federal oversight should extend to 'relatively permanent' waters and wetlands with a 'continuous surface connection' to large rivers and streams."⁹⁶

EPA's New 'Waters of the U.S.' Website

On May 15, 2017, EPA launched a new website to keep the public updated regarding EPA's review of the definition of "waters of the United States."⁹⁷ Visit the site here: <https://www.epa.gov/wotus-rule>. The new website replaced the website developed for EPA's 2015 rulemaking process.

EPA announced it is consulting and coordinating with stakeholders and the public as it implements President Trump's E.O. on the WOTUS rule.⁹⁸ EPA clarified that the two-step process will entail (i) an initial rulemaking to rescind the 2015 WOTUS rule and recodify the old regulatory WOTUS definition, and (ii) a rulemaking to revise the definition of "waters of the United States" consistent with President Trump's E.O.⁹⁹

EPA Moves to Rescind 2015 WOTUS Rule

On June 27, 2017, EPA and the Army Corps proposed a rule rescinding the 2015 WOTUS Rule and to recodify the rule that existed prior.¹⁰⁰ The comment period for this proposed rule closed in September 2017.

EPA and the Army Propose to Amend the Effective Date of the 2015 Rule Defining "Waters of the United States"

On November 16, 2017, EPA and U.S. Department of the Army proposed to delay the effective date of the 2015 rule defining "waters of the United States" by two years.¹⁰¹ The two agencies believe this would give them the time needed to reconsider the definition of "waters of the United States." According to Pruitt, the delay would "allow [EPA] to minimize confusion as we continue to receive input from across the country on how we should revise the definition of the 'waters of the United States.'"¹⁰²

The 2015 rule, which redefined the scope of where the Clean Water Act applies, had an effective date of August 28, 2015. Implementation of the 2015 rule is currently on hold as a result of the Sixth Circuit's nationwide stay of the rule. The 2015 rule is also stayed in 13 states due to a North Dakota district court ruling.¹⁰³

EPA's and the Army Corps' proposal is separate from the two-step process the agencies propose to take to reconsider the 2015 rule. The agencies announced their plan to move quickly to take final action in 2018.¹⁰⁴

Enforcement and Compliance

Enforcement actions in the Pruitt administration were fewer than previous administrations through their first six months, according to an analysis by the Environmental Integrity Project.¹⁰⁵ A number of factors may explain this such as Pruitt's expressed desire of "cooperative federalism" by which EPA may have passed some enforcement responsibility off to the states, or involved states in existing enforcement actions which would slow a case down. Second, enforcement actions take time to develop and starting and finishing an enforcement case, particularly complex ones, rarely happens within six months. Lastly, EPA takes many factors into consideration when weighing its enforcement discretion. The numbers, however, speak for themselves. The following are the only enforcement actions from Region 2 during 2017 for which the Region issued a press release.

EPA Takes Action to Protect Health Care Facilities from Unregistered and Mislabeled Antimicrobial Pesticides—New Jersey Pharmaceutical Company Settles Pesticides Violations

On November 1, 2017, EPA Region 2 announced it reached an agreement with Pharmaceutical Innovations of Newark, New Jersey resolving alleged violations of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).¹⁰⁶ EPA had alleged that Pharmaceutical Innova-

tions sold and distributed the unregistered and misbranded antimicrobial pesticides “PI Spray” and “PI Spray 2.”

The unregistered and misbranded pesticides were used to clean ultrasound and mammography equipment and other surfaces in health care facilities. As a result of the settlement, Pharmaceutical Innovations stopped producing and selling their unregistered and misbranded products called “PI Spray” and “PI Spray 2” and did a voluntary recall of both products.¹⁰⁷

The product labels, product inserts, and promotional material for both products: (i) made unsubstantiated claims to control bacteria and kill viruses; (ii) made unsubstantiated claims as to the efficacy and safety of the product; and (iii) did not list the inert ingredients or bear the name and percentage by weight of each active and inert ingredient.¹⁰⁸

In the settlement, Pharmaceutical Innovations agreed to pay a civil penalty of \$250,000 and certified that it has come into compliance with FIFRA.¹⁰⁹

According to EPA, the settlement will help ensure that sellers and distributors of antimicrobial products do not make claims about pesticides without first registering their products with EPA. It will also help ensure that antimicrobial products are not mislabeled with unsubstantiated claims or without important use information.¹¹⁰

EPA Takes Action to Protect Water Quality in Puerto Rico—Boat Marina Company Settles Clean Water Act Violations

On July 3, 2017, EPA announced it reached an agreement with Marina PDR Operations, LLC, resolving its alleged failure to apply for and obtain coverage under the 2008 National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for its discharges of stormwater runoff from the Marina Puerto Del Rey (“Marina PDR”) into the Caribbean Sea.¹¹¹ The company agreed to pay a civil penalty of \$77,500.

Marina PDR is a facility that offers mainly storage and maintenance services for boats, including painting and repairs to hulls, fiberglass, and engines. Prior to the settlement, EPA brought Marina PDR Operations into compliance with stormwater runoff limits by issuing an Administrative Compliance Order to the company.¹¹² The order required the company to obtain coverage under the 2015 NPDES Multi-Sector General Permit for its stormwater runoff associated with activities from Marina PDR.¹¹³ By complying with the general permit, the company reduced pollutants going into the Caribbean Sea, including an estimated pollutant reduction per year of 6,519 pounds of total suspended solids, 190 pounds of aluminum, and 815 pounds of iron found in sediments and runoff from activities generated at the marina.¹¹⁴

Improved Leak Detection Technology and Centralized Monitoring to Be Deployed at 23 Albany, N.Y. Area Gas Stations

On May 4, 2017, EPA announced an agreement with the owners of underground storage tanks at 23 gas stations in the Albany, New York area, and at two gas stations in Connecticut and one gas station in New Hampshire, to improve detection and monitoring of leaks from underground tanks that store petroleum products.¹¹⁵ Falcon Petroleum, LLC, and its affiliated companies, RGLL, Inc. and GRJH, Inc., are expected to spend more than \$200,000 to upgrade leak detection equipment at seven of their gas stations in New York and more than \$225,000 on a comprehensive centralized monitoring program that will improve the collection and management of, among other things, the leak detection data collected throughout their network of gas stations. When not properly maintained, underground storage tanks have the potential to contaminate soil, surface water and groundwater. Falcon and its affiliated companies will also pay a \$60,000 civil penalty.¹¹⁶

This settlement resolves the claims identified in the United States’ complaint, filed in the United States District Court for the Northern District of New York in December 2016, which alleged that at eight gas stations in the Albany area, the companies had failed to comply in the past with important requirements of the federal Resource Conservation and Recovery Act. The agreement requires that these gas stations, located in Ballston Lake, Croseyville, Hoodsick, Hudson, Queensbury, Troy and Valatie, New York, fully comply with these regulations.¹¹⁷

Under the agreement, Falcon and its affiliated companies have also agreed to connect the tanks at their 23 gas stations in New York, two gas stations in Connecticut and one gas station in New Hampshire, to a centralized monitoring system. This system will assist in identifying leaking tanks and pipes by collecting all leak detection data and electronically transmitting it to a central monitoring location. This will allow the accelerated detection and correction of any leaks.¹¹⁸ Under the agreement, the companies will operate and maintain the centralized monitoring equipment for all the underground storage tanks covered in the agreement for a minimum of five years. The centralized monitoring component of this agreement is consistent with EPA’s Next Generation enforcement efforts, which focus on increasing compliance with environmental regulations by integrating the use of advanced technologies, such as pollution detection systems and information technologies, with traditional compliance measures.¹¹⁹

Endnotes

1. See <https://www.epa.gov/home/back-basics-agenda>.
2. See Bob Sussman, *Back to Basics or Slash and Burn? Scott Pruitt’s Reign as EPA Administrator*, 47 ELR 10917, 10920 (Nov. 2017), available at <https://www.eli.org/sites/default/files/docs/47.10917.pdf>.

3. EPA Press Release, EPA Administrator Pruitt Denies Petition to Ban Widely Used Pesticide (March 29, 2017), available at <https://www.epa.gov/newsreleases/epa-administrator-pruitt-denies-petition-ban-widely-used-pesticide-0>.
4. *Id.*
5. EPA Press Release, EPA Withdraws Information Request for the Oil and Gas Industry (March 2, 2017), available at <https://www.epa.gov/newsreleases/epa-withdraws-information-request-oil-and-gas-industry>.
6. Letter from 11 State Attorneys General to EPA Administrator Pruitt (March 1, 2017), available at https://www.epa.gov/sites/production/files/2017-03/documents/letter_from_attorneys_general_and_governors.pdf.
7. See Proposed Rule, Repeal of Emission Requirements for Glider Vehicles, Glider Engines, and Glider Kits, 82 Fed. Reg. 53,442 (Nov. 16, 2017).
8. See Extension of Deadline for Promulgating Designations for the 2015 Ozone National Ambient Air Quality Standards, 82 Fed. Reg. 29,246 (June 28, 2017).
9. See N.Y. Attorney General Press Release, A.G. Schneiderman Files Lawsuit Against Trump EPA for Stalling Action on Clean Air (Aug. 1, 2017), available at <https://ag.ny.gov/press-release/ag-schneiderman-files-lawsuit-against-trump-epa-stalling-action-clean-air>; EPA Press Release, EPA Continues to Work with States on 2015 Ozone Designations (August 2, 2017), available at <https://www.epa.gov/newsreleases/epa-continues-work-states-2015-ozone-designations>; see also Withdrawal of Extension of Deadline for Promulgating Designations for the 2015 Ozone National Ambient Air Quality Standards, 82 Fed. Reg. 37,318 (Aug. 10, 2017).
10. *Id.*
11. See *Clean Air Council v. Pruitt*, 862 F.3d 1 (D.C. Cir. 2017).
12. See *Center for Biological Diversity, et al. v. Pruitt* (N.D. Cal. Aug. 31, 2007).
13. See *id.*; see also James L. Simpson, Case Summary of *Center for Biological Diversity, et al. v. Pruitt*, ABA, SEER, Air Quality Committee website, available at https://www.americanbar.org/groups/environment_energy_resources/committees/dch/aq/20170915_center_for_biological_diversity_v_scott_pruitt.html.
14. EPA Smart Sectors Launch, 82 Fed. Reg. 44783 (Sept. 26, 2017).
15. EPA Press Release, EPA Launches Smart Sectors Program (Oct. 3, 2017), available at <https://www.epa.gov/newsreleases/epa-launches-smart-sectors-program>.
16. See <https://www.justice.gov/opa/press-release/file/971826/download>.
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18. See *id.*
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Annual Meeting Awards—2017-2018

Each year the Environmental & Energy Law Section recognizes individuals and organizations whose work and commitment has made a significant contribution to the environment. The Section, at its annual Business Meeting in New York City, presented the Environmental Law Section Award, which is given to honor distinguished service in the protection of the environment, to **Dr. Ross S. Whaley in 2017** and to **Marcia Bystryn in 2018**.

Dr. Whaley was selected for the Environmental Law Section Award due to his environmental leadership and achievements in education, government service, and promoting collaborative efforts on critical environmental issues over a lifetime of dedicated work.

Dr. Whaley served as Chair of the Adirondack Park Agency (APA) from 2003 to 2007. In his position as Chair, Dr. Whaley advanced a balanced vision for the Adirondack Park as a place where resource preservation and sustainable economy are both desirable and possible. Chairman Whaley supported the protection of the Park's scenic appeal, water bodies and wetlands as well as the need to enhance Adirondack communities with a focus on affordable housing, infrastructure and economic diversification. During his term, he oversaw a comprehensive classification of State lands within the Adirondack Park.

Prior to becoming Chair of the APA, he served as president and professor at the SUNY College of Environmental Science and Forestry. He has also served in a number of public and professional service activities, including as chair of the State Needs Task Force on Environmental Conservation and as a member of Governor Mario Cuomo's Commission on the Adirondacks in the 21st Century. Dr. Whaley also served as Director of Forest Economics Research at the United States Forest Service.

Dr. Whaley is a founding member of the Common Ground Alliance, a group that brings together people from different backgrounds to address issues related to the environment and economics in the Adirondack Park, and is a senior advisor to the Adirondack Landowners Association. He continues to be an influential advocate for sustainable development.

Dr. Whaley presented keynote remarks at the Section's Business Meeting in which he addressed the challenges in applying laws and policies on environmental issues. He noted the great experiment of the Adirondack Park in New York, where wide-ranging conservation efforts are undertaken in a diverse area of over 100 towns and villages and with a population of about 130,000 people. In working to the betterment of the Park and its residents, Dr. Whaley emphasized the importance of pursuing legislative and regulatory action with civility and transparency, ethically and positively to achieve beneficial results.



Section Members Virginia C. Robbins and Louis A. Alexander presenting the 2017 Environmental Law Section Award to Dr. Ross S. Whaley.

Marcia Bystryn. Marcia Bystryn was selected for the Environmental Law Section Award in recognition of her distinguished and long-standing leadership and dedication to the environment, including her service as executive director and president of the New York League of Conservation Voters. She joined the League as executive director in 1999 and was named president in 2008. In those capacities, she has advocated for and helped advance a broad range of forward-looking environmental policies and legislative initiatives for New York State, including climate change, clean air and water, public health, renewable energy, and open space.

Marcia Bystryn has been a well-respected environmental policymaker throughout her career. Prior to joining the New York League of Conservation Voters, she served as senior corporate policy management for the environment and then senior business manager for economic development at The Port Authority of New York and New Jersey. At The Port Authority, she oversaw the development and implementation of corporate environmental policy and fostered new business opportunities in the areas of regional solid waste management, deregulation of the electrical industry and port expansion. She also formerly served as the assistant commissioner for recycling at New York City's Department of Sanitation, where she designed and implemented the city's recycling program.

Ms. Bystryn has served on various city initiatives, including the PlanNYC team and the OneNYC team, as well as state environmental task forces. Her efforts to promote funding for the state's Environmental Protection Fund and clean water infrastructure initiatives are well recognized and have been instrumental in securing monies for these vital programs.

Prior to the presentation of the Award, Section Member Gail Port, who has worked with Marcia Bystryn at the New York League of Conservation Voters and at the League's Ed-

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ucation Fund, offered some personal remarks. Gail noted how the New York League had grown in stature, influence, and efficacy under Ms. Bystry's leadership. Gail remarked how Marcia Bystry works with all stakeholders in a bipartisan way to achieve environmental goals, noting the effectiveness of Ms. Bystry at consensus building and her political instincts and strategic sense.

Ms. Bystry noted the present-day challenges relating to the environment. She stressed the need to persevere in building on the successes of the past to ensure a better environmental future for all.

Section Council Awards

In addition to the Environmental Law Section Award, Section Council Certificates were given in 2017 to three members of the Section: **Gerard P. Cavaluzzi**, in recognition of his service as Co-Chair of the Environmental Insurance Committee for two decades, during which time he has sponsored legal education programs on emerging issues in environmental insurance, as well as providing important updates on environmental insurance issues and developments to the Section membership; **John L. Parker**, in recognition of his service as Co-Chair of the Legislation Committee in sponsoring legislative-oriented programs, including the annual Legislative Forum, and in furnishing reports and updates for the Section's membership on critical governmental policy developments; and **Jillian Kasow**, in recognition of her service as Co-Chair of the Legislation Committee, in sponsoring legislative-

oriented programs, including the Legislative Forum, and providing information and reports on State legislative developments to the Section.

In 2018, Section Council Certificates were given to the following Section members: **James P. Rigano**, in recognition of his service as Co-chair of the Continuing Legal Education and Ethics Committee, during which time he organized CLE programs on a variety of environmental topics, advanced opportunities for instruction on a wide range of environmental issues for the legal community, and implemented innovative approaches in legal education; **Robert Alan Stout, Jr.**, in recognition of his service as Co-chair of the Membership Committee in promoting initiatives to attract diverse attorneys to the Section while retaining and enhancing the involvement of current members, and in evaluating the interests and needs of Section members to ensure that the Section continues to provide a responsive forum; and **Alita J. Guida**, in recognition of her service as Co-Chair of the Mining and Oil & Gas Exploration Committee in sponsoring and organizing programs for the Section that address mining and oil and gas issues, and in providing significant information on legal developments in the energy sector.

The Awards Committee in 2017 was comprised of the following members—Louis Alexander (chair), Ruth Moore, Virginia Robbins, Robert Stout, and Randall Young. For 2018, the Awards Committee included Miriam Villani, Jill Kasow, Frank Piccininni, and Louis Alexander (chair).

Lou Alexander

In Memoriam

Hon. Maurice D. Hinchey

It is with sadness that we report the loss of Congressman Maurice D. Hinchey, 79, of Saugerties. He died peacefully Nov. 22, 2017, after a long battle with Frontotemporal Degeneration, a rare neurological condition.

A progressive Democrat who attracted numerous Republican and Independent supporters, he was the first Democrat elected to the state Legislature from Ulster County since 1912. Maurice later served in Congress for 20 years, serving a seven-county district. He won most of his elections with overwhelming majorities, becoming one of the most popular elected officials in the region, in large part because of his outstanding constituent work.

Maurice's 38 years of public service earned him a reputation as a tireless champion for working people. He was a dedicated fighter for economic fairness, women's rights, renewable energy, and preserving the environment. He was a sponsor of many of the first laws protecting our water, air, and land. Governor Mario Cuomo once called him the "environmental conscience of New York State."

Serving 18 years in the Assembly—14 years as Chair of the Environmental Conservation Committee—Maurice became known for his investigative work of the infamous Love Canal. He later led a 10-year investigation into illegal dumping of hazardous waste by organized crime which brought convictions against

more than 20 people. He was responsible for the development of the first statewide system of Urban Cultural Parks and the creation of the Hudson Valley Greenway.

Maurice was elected to the U.S. House of Representatives in 1992, where he created the Hudson River Valley National Heritage Area, and provided the first funding for the Walkway Over the Hudson, both of which became important economic engines for the region. On the powerful House Appropriations Committee, Maurice advocated for smart economic development and brought millions of dollars into the district, creating jobs. Maurice was a leading opponent of hydraulic fracturing.

In Memoriam

John G. Nevius, Esq.

It is with much sadness that we report the passing of John G. Nevius. John died peacefully in Vermont on August 12, 2017, of cancer. Beloved husband of Alison Hess, devoted father of Anne and Kathleen, and son of Mary Ellis (Peltz) Nevius and the late Garrett Winder Nevius.

He is survived by sisters Nancy Bacon, Christy Nevius, and Mary Lansing. John was a direct descendant of 1652 Dutch settler Johannes Nevius, third Secretary of New Amsterdam, and a Trustee of the Holland Society of New York. He grew up in Farmington, CT and spent summers on Sutton Island, Maine.

A hydrogeologist and civil engineer with degrees from the Universities of Connecticut and Pennsylvania, John loved the outdoors and worked for the U.S. Environmental Protection Agency, receiving a National Excellence Award and a Bronze Medal, and becoming a licensed professional engineer. After earning a J.D. from Pace University, John joined Anderson Kill, P.C. in 1995 and was founding Chair of the firm's Environmental Law Group.

He lectured and wrote widely on insurance, policyholder advocacy, and technical matters, and was an adjunct professor at Pace Law School and popular mentor. John will be remembered for his integrity, intelligence, generosity, and quick wit.

Donations can be made in John's name to ACLU or Cranberry Isles Realty Trust, P.O. Box 4, Cranberry Isles, Maine 04625 (affordable housing to support year-round working families and sustain island community way of life).



Eugene Leff, Esq.

Eugene Leff, New York's lead lawyer in the Love Canal case, died on April 12, 2018, as a result of amyotrophic lateral sclerosis.

Love Canal is the symbol of an environmental contamination catastrophe and the case helped prompt the environmental movement and the creation of the federal Superfund program.

Gene was the assistant attorney general assigned to the case and he reached a record settlement for the state at the conclusion of a 14-year lawsuit. The chemical company responsible for the dumping of hazardous waste at the Niagara Falls neighborhood, agreed to pay \$98 million and to pay the cleanup costs and other expenses that eventually added up to millions more.

In addition to representing the state in the Love Canal case, Gene headed the environmental bureau of the Attorney General's office. He litigated for the cleanup of PCBs and other contaminants from the Hudson River, and the remediation of petroleum that had leaked into Newtown Creek over decades.

In his role as deputy state environmental conservation commissioner beginning in 2011, Gene drafted legislation to safeguard the state against future environmental disaster.

Eugene J. Leff was born on August 10, 1944, in Manhattan to Dr. Abraham Leff, a psychiatrist, and the former Rose Levy, a pharmacist. He grew up on Long Island and then in Wood-Ridge, N.J. He earned a bachelor's degree in political science from Columbia College and a J.D. from Yale Law School. He also received a master's degree in Russian and East European studies from Yale and sang with the Yale Russian Chorus.

After receiving his law degree, Gene clerked for a federal judge and then joined a Wall Street firm whose clients included Johns Manville, the building-products manufacturer.

He defended the company in asbestos injury cases. He left that position and joined the National Employment Law Project, which enforces workplace standards, and then joined the attorney general's office.

Gene retired from the state in 2016.

New Member – Meaghan Colligan

Our New Member spotlight this issue turns to Meaghan A. Colligan. Meaghan is an associate attorney with Knauf Shaw LLP, where she focuses her statewide litigation, transactional, and regulatory compliance practice on environmental and land use law. I spoke with her at length about her history, goals, and achievements. I can say without reservation that I was fortunate to have this conversation with her.



Meaghan A. Colligan

Meaghan comes to the practice of law after a distinguished study of sociology with a focus on human rights. During her years teaching elementary school children as a Teach for America Corps member, she was exposed to the challenges suffered by her students during several natural disasters and the discovery of toxic contamination in a student's neighborhood. These experiences led to an epiphany that a clean environment is an essential human right, and she committed herself to assisting communities through environmental law.

Meaghan is a mission- and values-driven practitioner. Her mission is to provide a thoughtful, client-based approach to case management and business. She plans her case strategies by mapping issues and controversies over time, identifying how she will accomplish the clients' goals through weekly and even daily actions. She excludes a detail-oriented and strategic approach to problem solving. When I asked Meaghan about her approach to lawyering, she explained that she adheres to the lessons she learned from playing competitive sports: "If you outprepare the competition, you will likely win." Her preparation insures progress in her clients' cases and affords effective case tracking. Meaghan also strives to foster a strong team and network around her, and takes responsibility to facilitate growth in others. She values direct communication, gratitude, passion, and listening among her best qualities, which she identifies as the most important traits of a good leader.

Meaghan attributes a great deal of her inspiration from her work at the law office of Jeanne Bonney, who initially brought her in to perform administrative duties

during her teenage years. Over five years, Ms. Bonney exposed Meaghan to the human aspects of the profession, including the very personal troubles that attorneys are asked to help resolve. Meaghan loved the experience and continues to emulate Ms. Bonney in her practice as a service-driven attorney.

Meaghan reports that she sincerely enjoys environmental law and assured me that she is not yet bored! She stated: "Every day I have a new problem to resolve." In her primary area of representation—contaminated sites—she notes that "every site is different and the law changes constantly. Governmental interpretations and changing regulations are a challenge, and each case requires a specific and particular analysis and different approach."

Meaghan graduated from the Elisabeth Haub School of Law at Pace University with a Certificate in Environmental Law and a Master of Science from Bard Center for Environmental Policy. As an adjunct professor at the State University of New York at Geneseo, she recently taught "Sociology of Law," a constitutional law course that traces the sociological influences and consequences of the Bill of Rights.

Meaghan is also developing into a leader among attorneys. Since 2014, she has served as a Vice-Chair for E-Communications and Social Media of the Environmental Transactions and Brownfields Committee of the American Bar Association Section of Environment, Energy, and Resources, where she has organized the publication of monthly online legal news summaries on interesting and important developments in environmental transactions and brownfields law. She developed this program with colleagues to provide law students and other new attorneys an opportunity for leadership, professional growth, and writing. She believed that she could help to create a national community and assist other attorneys and law students seeking to improve their writing and build their online profiles. Meaghan also serves as the New York State Bar Association (NYSBA) Environmental and Energy Law (EELS) Social Media Task Force Chair, and is a member of the Education Committee of the Genesee Finger Lakes Chapter of the Air and Waste Management Association.

We expect great contributions from Meaghan, and I suspect she provides excellent service to her clients and firm. Finally, for those who (understandably) would like to spend time with Meaghan, her favorite meal is breakfast. She prefers a cup of green tea with Ezekiel toast, eggs, and spinach.

Keith Hirokawa

Long-Time Member—John Greenthal

For this issue, we have focused our Long-Time Member profile on John Greenthal.

John is a former Section Chair and a member of the Section's Executive Committee. He played a significant role in the development of the Section's Diversity Plan, which has been updated and expanded and has contributed to ensuring greater opportunities for more people to have active roles in CLE programs and in Section leadership positions. John acknowledges that, despite progress, there remains much room for advancements and improvements in the Section's diversity initiatives.



John Greenthal

John's practice in both government and the private sector has concentrated on the investigation and cleanup of contaminated properties. As an attorney at the Department of Environmental Conservation, he played a key role in environmental enforcement. He was Regional Attorney of Region 3 (the Mid-Hudson) from 1976 to 1979, before moving to Albany and eventually founding and serving as the first Director of the Division of Hazardous Waste Enforcement and of the Division of Environmental Enforcement. At that time, the state was developing its own enforcement programs, often independent of and ahead of the federal programs. John also chaired the Northeast Hazardous Waste Project, an 11-state organization of enforcement officials. John moved from DEC to the firm now known as Nixon Peabody in 1987, where he currently holds the position of Senior Counsel.

John has been involved in volunteer teaching at the high school level for the past five years. He developed a course he named "Environmental Issues and Public Policy," which seeks to have students explore issues of law, economics, community issues, and politics—along with science—in the context of specific, and usually controversial, environmental topics. He currently teaches classes in an Environmental Science course at a New

York City private school. John believes that encouraging high school students to critically analyze important environmental public policy matters will instill in them both an enhanced ability to think through difficult and complex issues and a spirit of activism that will lead to a stronger and more determined environmental citizenry in the future.

In addition, John has been a member of the Statewide Board of the New York League of Conservation Voters for almost 20 years. He is also on the Executive Committee of the Schenectady County Environmental Advisory Council, and is a member of the New York City Bar Association Environmental Law Committee.

Finally, John asked for the opportunity to put forward three ideas of his for the Environmental and Energy Law Section. Because of limitations of space, they are presented in brief, bullet format:

1. To the extent that his first choice, a practical skills pro bono component of CLE requirements, cannot be easily implemented, John would like to see a Section task force organize an effort by which Section members become involved in community activities on environmental issues on a pro bono basis.
2. John proposes, just as there is an ethics component of many Section CLE programs, that one segment of a Section CLE program in at least one meeting every year focus on an Environmental Justice issue. Such program segments would deal with how laws, regulations, policies and/or projects are impacting Environmental Justice communities.
3. John also suggests that the Section take on a project where a course or multiple courses are developed for middle school and/or high school which introduce students to the considerations that go into environmental public policy development. Courses that are taught currently focus on environmental science, but John believes that to really understand the way in which decisions are made in the environmental area, students need to be introduced to broader factors and forces.

Aaron Gershonowitz

Eileen Millett Appointed to the Committee of Character and Fitness

The Justices of the Appellate Division of the Supreme Court, First Department, have appointed Phillips Nizer LLP Environmental and Real Estate Law partner Eileen D. Millett as an Examiner of the Character and Fitness applicants for admission as attorneys.

In this prestigious assignment, Ms. Millett is on the committee that ensures that any person admitted to the bar “possesses the character and general fitness requisite for an attorney and counsellor-at-law.”

The appointment continues Ms. Millett’s distinguished career of public service. She was general counsel for 15 years at the Interstate Environmental Commission, formerly known as the Interstate Sanitation Commission. She also served as an assistant general counsel with the New York State Department of Environmental Conservation and as an assistant general counsel with the Environmental Protection and Criminal Prosecution Bureaus of the New York State Department of Law.

“We are very proud that the Eileen has been selected to serve on the Committee on Character and Fitness. She has established a reputation as a distinguished and highly respected attorney. This selection shows how highly her peers think of her,” said Mark Elliott, co-chair of the firm’s Litigation Department.

At Phillips Nizer, Ms. Millett provides counsel to clients regarding environmental risks in complex environmental enforcement proceedings, land use, environmental due diligence, remediation, brownfields, superfund, and hazardous waste, including OSHA audits.

She also represents clients in administrative proceedings, real estate transactions and environmental compliance, and she advises clients in permit issues, adopting sustainable development policies and climate change initiatives.

Congratulations, Eileen.

Students Win Environmental Law Writing Competition

Essays by Students in Professor Michael Gerrard’s Seminar on Climate Change Address Challenges Ranging From Fossil Fuels to Protection for Federal Lands

Five current and former Columbia Law students have earned top honors in a statewide essay competition designed to challenge law students to analyze environmental issues of the day.

Anna Baxendale, ‘17 LL.M., won first prize in the 2017 William R. Ginsberg Memorial Essay Contest for her essay, *Fraud, Free Speech and Fossil Fuel: Lessons from Big Tobacco for Big Oil*. It examines parallels between the conduct of ExxonMobil and tactics employed by the tobacco industry that led to the U.S. Government’s successful racketeering case against cigarette makers.

The win marks the fourth consecutive year that a student at Columbia Law School has finished first in the annual competition, which is sponsored by the Environmental & Energy Law Section of the New York State Bar Association.

All five winners were students in Advanced Climate Change Law, a seminar taught by Michael Gerrard, Andrew Sabin Professor of Professional Practice and director of the Sabin Center for Climate Change Law. “We are

in an era when environmental lawyers are more needed than ever, and Columbia is producing a steady stream of future leaders in this field, as evidenced by this string of essay contest winners,” Gerrard said.

The conduct of companies faced with climate-related risks “is an area of law and policy that is only growing in importance year after year, and this contest is a wonderful way to encourage students to research and write in this field,” said Baxendale, a U.K. lawyer who spent several years working in London before coming to Columbia.

From Fossil Fuels to Federal Lands

“Having grown up in a community that is very environmentally aware, I was excited to have the opportunity to take a class with a leader like Professor Gerrard, who was an invaluable resource to me,” added Baxendale, who currently works in New York for the law firm Kirkland & Ellis.

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Anna Baxendale '17



Matthew Scarano '17



Lauren Packard '17



Christian Termyn '17



Joseph Margolies '18

Writing Competition Winners

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Joseph Margolies '18, who holds a bachelor's degree in public policy, *summa cum laude*, from Princeton, tied for second-place honors with his essay, *Fossil Fuel Extraction Bans: A Takings Analysis*. The article examines whether regulatory takings could help move the U.S. away from its dependence on fossil fuels.

Margolies tied with Matthew Scarano '17, whose essay, *Withholding Municipal Services to Facilitate Coastal Retreat: Legal Risks and Possibilities*, presents a tool that local governments in the U.S. can use to address sea level rise. Previously, Scarano's article won first place in a national student writing competition held by American Planning.

Christian Termyn '17, an associate in the energy, environment, and resources group at the law firm Perkins Coie in San Francisco, tied for third place in the competition with his essay, *No Take Backs: Presidential Authority and Public Land Withdrawals*. In his article, he argues that federal law bars presidents from withdrawing protections from lands designated by their predecessors for protection.

Termyn tied with classmate Lauren Packard '17, a legal fellow with the public rights division of the California Department of Justice. Packard's essay, *Designing an International Liability Regime to Compensate Victims of Solar Radiation Management*, offers recommendations for an international liability regime that would govern solar radiation management (SRM) to resolve disputes and compensate victims of SRM deployment.

While a CLS student, Packard, awarded the Alfred S. Forsythe Prize for excellence in environmental law, researched vehicular emissions regulations for Charles Sabel, the Maurice T. Moore Professor of Law. Work-

ing under the supervision of Gerrard and in the Law School's Environmental Law Clinic, Packard also published a note, *Michigan: An Intrusive Inquiry into EPA's Rulemaking Process*.

"The conduct of companies faced with climate-related risks 'is an area of law and policy that is only growing in importance year after year, and this contest is a wonderful way to encourage students to research and write in this field.'"

— Anna Baxendale

The competition honors William R. Ginsberg, a professor of environmental law, advocate for the preservation of open space, and former New York City commissioner of parks and recreation.

This article was reprinted with permission from Columbia Law School's website. The essays can be accessed through links on the school's site, www.law.columbia.edu/news/2017/11/environmental-writing-competition-award-winners. In addition, first place winner Anna Baxendale's essay appears in this issue of The New York Environmental Lawyer.

It's Possible to Move to Renewable Energy

By Carl R. Howard

The essential point I've been making is that great progress is being made in the collective global effort to slow Climate Change (CC), but we are fast running out of time. We need a greater sense of urgency. We absolutely must work toward a future of zero carbon emissions. It is entirely possible to move to renewable energy. We just need the collective will to push for it and push hard.

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My co-chair of the NYSBA EELS Global Climate Change Committee, Kevin Healy, recently moderated a panel on Climate Change. A representative from Pfizer Pharmaceuticals displayed a graph showing the company's GHG emissions steadily decreasing from millions of somethings (his graph didn't specify) down to just one million by 2050. That's the right trend but the wrong stopping point and indeed it misses the point. The graph needs to extend to 2100 and it needs to descend to zero. That's the essential idea that needs to be promoted within the company and at large.

Immediate changes are necessary across the board in electricity generation, heating and cooling buildings, including our own homes, powering industry and in transportation. To have a chance of limiting global temperature increases to below 2 degrees C, the International Energy Agency and International Renewable Energy Agency suggest that global energy-related carbon emissions must peak by 2020 and fall by more than 70 percent in the next 35 years. This requires that we triple the annual rate of energy efficiency improvement, retrofit the entire building stock, generate 95 percent of electricity from low-carbon sources by 2050 and shift almost entirely towards electric cars. We can do this.

As noted (Blog 3), New York City has a plan (PlaNYC) to reduce GHG emissions by 80 percent by 2050. Mayor Bill de Blasio intends to force thousands of aging buildings to become more energy efficient, a first-of-its-kind initiative intended to make the city a national leader in reducing GHG emissions.

The initiative would mandate that owners of existing buildings larger than 25,000 square feet invest in more efficient heating and cooling systems, insulation and hot-water heaters.

If approved by the City Council, the requirements would apply to about 14,500 private and municipal buildings, which account for nearly a quarter of the City's emissions. Most buildings would need to comply with

new efficiency targets by 2030, or their owners would face penalties.

In 2016, de Blasio signed an executive order reaffirming the city's commitment to the Paris climate accord just days after Trump announced his intention to withdraw from it. De Blasio directed city agencies to report by Sept. 30 on their efforts to achieve reductions in carbon emissions.

In August, 2017, the Urban Green Council, the Real Estate Board of New York and other groups made joint recommendations to improve energy efficiency of local buildings. This initiative could result in lower energy costs over time and create perhaps 17,000 "green jobs" as older structures are improved. But many owners likely will face big upfront costs to meet the new requirements. City officials said they intend to help owners afford energy upgrades through low-interest financing.

After Trump announced that he would pull the United States out of the Paris accord, numerous governors, mayors and businesses pledged to proceed with emissions reductions. A group called Climate Mayors, with 377 members, including de Blasio, committed to honoring the U.S. pledge.

To that end, de Blasio has overseen the conversion of nearly 72% of the city's 250,000 street lamps from old, sodium vapor bulbs to LED bulbs. The city is on target to upgrade the rest of its lights, which do not include those on highways operated by the state, by the end of 2018. The bulbs last longer than the old lights and use half the energy, allowing for millions of dollars in savings. Los Angeles, Oahu and Phoenix are planning similar upgrades. (Perhaps you could get your city/town to do the same.)

New Jersey will require much steeper reductions in GHG emissions to reach its goal of lower carbon pollution (1990 levels by 2050). A decade after New Jersey enacted the Global Warming Response Act, the state lacks a detailed and comprehensive strategy to achieve its goal and is unlikely to it.

Major steps are needed, and are entirely possible, to curb GHG emissions by 80 percent in New Jersey, which

CARL R. HOWARD is the Co-chair of the Section's Global Climate Change Committee. The views expressed are entirely the author's. The three articles in this section were originally posted in the Global Climate Change Blog of the Environmental and Energy Law Section Community at www.nysba.org/eelscommunity.

will require a 76 percent reduction from its current pollution levels. What is needed is public pressure to drive political will.

New Jersey can and should develop offshore wind capacity along its coast; mandate targeted reductions in energy use; and rejoin the Regional Greenhouse Gas Initiative, a multistate effort to curb global warming pollution from power plants.

Offshore wind could provide up to 40 percent of the state's electricity, but the next administration must rectify Christie's failure to develop a fiscal mechanism to pay for the power generated by wind turbines.

The state can and should enact an energy-efficiency portfolio standard requiring utilities to achieve mandated reductions in gas and electricity delivered to customers. While two gas utilities have voluntarily initiated such programs, the state Board of Public Utilities (PUB) has balked at a statewide program.

Some states, like California and Minnesota, are trying to put a price on carbon pollution as a way of encouraging less harmful ways of creating electricity or transporting people.

In New Jersey, the transportation sector is the largest source of GHG emissions (44.2 percent), much larger than the power sector (20 percent). Policy options exist that would increase the efficiency of vehicles or promote zero-emission vehicles, like electric cars, through rebates and incentives to install charging stations. Both the Legislature and the BPU are looking into it but are hesitant to make significant changes absent clear public demand. Other options in this sector include reducing vehicle miles traveled due to mass transit, smart growth, and other policies.

New Jersey's reliance on renewable energy has yet to win final approval in the Legislature. One proposed bill would require 80 percent of the State's electricity be produced from renewable technologies like solar and wind.

New Jersey's emission profile differs from other states in that there is less pollution from the power sector because of its reliance on nuclear energy (43 percent of generated electricity) (I'll explain why nuclear power is unaffordable and dangerous in another blog). Mobile emissions and fossil fuels used primarily to heat homes and businesses, account for the greatest share of emissions in New Jersey.

For those keeping score at home, globally speaking, both August and the season (June, July and August) each were the third warmest on record. August 2017 was 1.49 degrees F above the 20th-century average of 60.1 degrees F. This was the third highest in the 1880-2017 record, behind 2016 (highest) and 2015 (second highest). This marks the 41st consecutive August and 392nd consecutive month with global temperatures at least nominally above average.

The impacts of this warming are being felt in the US. The recent hurricanes that devastated Houston, Florida and Caribbean islands including Puerto Rico, likely were the predicted result of warmer water than usual in the Atlantic. Similarly, the wildfires out west are the predicted result of dried-out forests and vegetation.

During the summer of 2017, tens of thousands of wildfires burned in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming. Fire suppression costs for the fiscal year topped \$2 billion, making 2017 the most expensive year on record. Fires have burned about 8 million acres, or about 2.5 million more acres than in an average year.

At this point it is not hard to predict the future, because it's here. We're going to have more of what we've been having. Only worse, because we keep pouring gas on the proverbial and literal fire in the form of CO₂.

Over the past 10,000 years, during the rise of human civilization, the climate has been relatively stable. Human civilization depends on this stability. Our future will be determined by the laws of chemistry and physics: we know that temperature increases lag behind CO₂ emissions, a crucial fraction of which can persist in the atmosphere for thousands of years. Similarly, sea level rise (SLR) lags well behind temperature increases. The result is that the world's oceans will continue rising for thousands of years even after temperatures stabilize.

The current SLR is about 1.2 inches per decade, considerably faster than 50 years ago, and may well increase to several inches per decade in a century. This acceleration may be under way as we may be seeing the early stages of irreversible glacial collapse in Greenland and Antarctica. If you want to see dramatic footage of how life as we know it is currently being threatened, see *An Inconvenient Sequel*, Al Gore's new film. We may think of glacial melt as being a slow drip of fresh water into the sea, but the fact is that enormous torrential flows of glacial melt are pouring into the sea, and not only that, such flows reach bedrock and lubricate the slide of giant ice sheets into the sea, which will dramatically add to SLR. This is happening. Go see for yourself.

The geological record reveals that historic SLR may have occurred at rates of one foot per decade for centuries. Nothing remotely like that has occurred in recorded human history. Yet having happened before, and given current GHG emissions trends, we may well see such rapid rates, or higher, again. Further, such steadily accelerating SLR is possible and can become unstoppable for millennia because inertia in the climate system is enormous; SLR could reach, far in the future, 80 to 170 feet. But the realization that such rise is inevitable could come much sooner, within our lifetimes certainly.

To understand the earth's temperature sensitivity, note that a temperature increase of 7 to 12.6 degrees F (4

to 7 degrees C) is what separates today's "ideal climate" from the dramatic conditions of the last Ice Age, which peaked about 26,000 years ago. At the height of the last Ice Age, ice sheets covered much of the northern hemisphere and covered parts of North America, including New York City, to a depth of a mile or more. We are on a course leading to such catastrophic change.

Before the industrial revolution, concentrations of carbon dioxide in the atmosphere had been steady at around 260 to 280 parts per million for thousands of years. By the Spring of 2017 we passed 410 parts per million and despite gains in renewable energy generation, CO2 concentrations continue to steadily increase. As carbon dioxide accumulates in the atmosphere, 20 percent or more of the CO2 in the air today is expected to remain in the atmosphere until 3000, we will continue to see more of what we are currently experiencing: warmer temperatures, more frequent and more destructive and deadly storms, more glacial melt and SLR, more drought, disease and wildfires, reduced crop yields, more environmental refugees and climatic and political instability and conflict.

The important point here is the existence of massive inertia in the climate system, such that changes in temperature and SLR will continue long past the year 2100 based on emissions already in the atmosphere. To keep things from deteriorating past the point of no redemption, swift and significant changes are essential.

California is a leader in combating CC. The single biggest step the U.S. has taken to combat the effects of CC is the adoption of standards under the Obama administration that mandate deep cuts in emissions from the 190 million passenger cars on America's roads. Together, those vehicles regularly emit more earth-warming gases than the country's power plants.

But the major automakers have recently requested EPA to open a review of those standards. This may well be a prelude to a loosening of those targets.

California, however, has the unique authority to write its own air pollution rules. Twelve other states follow California's standards, which gives CA great influence. Whether or not CA can stick to the stricter standards will determine whether as much as six billion metric tons of GHG emissions and a savings to consumers of more than \$1 trillion at the pump over the lifetime of the cars, can be preserved.

When Congress established EPA in 1970 and passed the Clean Air Act later that year, California was granted a waiver to adhere to air pollution rules it had already promulgated. Automakers had supported Obama's initiative to harmonize a mishmash of GHG emissions and fuel economy standards set by EPA, the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB). Having taken almost \$80

billion in bailout money, General Motors and Chrysler, especially, were in no position to resist.

But now the automakers see an opportunity to roll back their commitments. They are currently required to progressively raise the fuel economy of their cars to an average of 54.5 mpg by 2025, nearly double the average in 2012. That is about 36 miles per gallon in real-world driving and would require automakers to speed the development of hybrid and electric cars, and to improve the fuel efficiency of their conventional fleets. Automakers argued that meeting that target would be prohibitively costly, forcing them to raise car prices or to make more battery-powered vehicles than Americans want to buy.

In a compromise, the automakers agreed to the program provided that the standards for the later years, 2022-25 would be subject to a midterm review. That review was under way when Trump won the presidency in late 2016. The day after his electoral victory, the Auto Alliance urged Trump to rework the standards.

The Obama administration then cut short the review and finalized the rules, calling them "feasible, practical and appropriate," just before leaving office. The automakers responded by writing to EPA requesting that it overturn Obama's 11th-hour decision. Pruitt's EPA reversed Obama's decision and called for comments on standards for model years 2021-25, thereby widening the review's scope. The NHTSA, which focuses mostly on auto safety, not emissions, is expected to lead the review.

"We're going to work on the CAFE standards so you can make cars in America again," Trump said in a speech in Detroit this year, referring to the Corporate Average Fuel Economy standards, which were first put in place in 1975.

But automakers need CARB on board. If CARB does not sign on to the reopened review, the automakers face the prospect of separate rules for California and its follower states, a coalition that covers more than 130 million residents and more than a third of the vehicle market in the United States.

CARB engineers helped expose Volkswagen's diesel emissions cheating, a scandal that affected about 600,000 cars in the United States and emitted huge amounts of pollutants, including CO2, into the air.

Just as market forces are trumping Trump's promise to bring back coal, so too may market forces eventually render the CAFE fight moot. GM recently announced that at some unspecified time it will cease producing gas and diesel vehicles, producing instead all-electric, zero-emission vehicles. It will start with two fully electric models in 2018, then at least 18 more by 2023. The new all-electric models will be a mix of battery electric cars and fuel cell-powered vehicles.

In recent months, Volvo, Aston Martin, and Jaguar Land Rover have announced similar moves. GM's declaration, though, is particularly noteworthy because it is among the largest automakers on the planet. It sold 10 million cars last year, ranging from pickups to SUVs to urban runabouts.

Trump may be moving to roll back fuel efficiency requirements in the U.S., but the rest of the world is moving toward a new, electric, age. The Netherlands and Norway said they plan to ban the sale of gas and diesel cars in the coming decades and Britain and France proposed to end the sale of new gasoline and diesel cars by 2040. Volvo recently said that the models it introduces starting in 2019 will be either hybrids or powered solely by batteries. China, the world's largest car market, and India, a potentially huge market, both plan to leave behind fossil fuel cars as well. These are essential, positive, steps. Now we have to get rid of our "old" cars, and especially SUVs, and buy EVs.

The developing world represents enormous opportunities and challenges. GM intends to grab as large a slice of the Chinese market as possible. It has already planned to launch 10 electric or hybrid electric cars there by 2020. This summer, it started selling a two-seat EV there (\$5,300). In 2016, GM sold more cars in China (3.6 million) than it did in the U.S. (3 million).

It is imperative that the developed world enable the growth of developing countries based on renewable fuels and not carbon-based fuels. Selling EVs in the developing world will only take us so far. Under the Paris accord the developed nations agreed to assist in the transfer of technology and cash to developing countries. The developed countries have been woefully inadequate in this area.

If you remember the film *Who Killed the Electric Car?* you will recall that it was GM. GM experimented with battery power in the EV-1, only to recall the two-seater from its owners, crush them all, and pile the carcasses in a junkyard. Early in the 21st century, while Toyota was making hybrids popular with the Prius, GM was pushing Hummers.

Over the past decade, the Detroit giant seems to have changed course. First came the hybrid electric Chevy Volt. Then came GM's coup, the Chevy Bolt, the 200-mile, \$30,000 electric car that preceded Tesla's Model 3. Now GM is seriously pursuing semi-autonomous and fully driverless cars and is hoping to eliminate vehicle pollution, congestion, and traffic deaths.

Much has been said about the inherent tension between environmental protection and economic growth. As the growth in the solar and wind energy sectors demonstrates, it is possible to achieve both. But choices must be made and there will be winners and losers. The market will dictate to a point and that is happening with regard to coal (losing) and renewables (winning). Still, growth at all costs is ultimately detrimental to us all and the election of Trump proves that "it's [still] the economy, stupid," especially jobs. We live in the short term while we must plan for the long-term, and that is proving to be very tricky. More education as to the peril we face from altering our climate is essential to increasing the pace of change. (More on the politics of Climate Change policy in later blogs.) Politicians will only push for change if we push them. We need to push and we need to know what we're talking about. Please see the books, references and links I've including in my Blogs.

That is our ammunition.

As Planet Warms, Expect More Powerful Storms

By Carl R. Howard

The record-shattering hurricanes that destroyed Caribbean Islands, including much of Puerto Rico, as well as Houston and Florida, were well publicized, but did you know that Ireland too was pummeled by a hurricane? Winds hitting Fastnet Island were recorded at 119 mph; on the mainland widespread damage, flooding and power outages occurred, and at least two deaths have been reported from trees falling on cars. The hurricane Ophelia reached Category 3 status and, in keeping with the prior hurricanes, was made possible in large part, by unusually warm ocean temperatures that were 1 – 2°C (1.8 – 3.6°F) above average. As the planet continues to warm due to the effects of human-caused global warming, we should expect to see more hurricanes

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maintaining their strength far to the north, allowing them to impact Europe.

The surreal experience of a hurricane-like storm in Ireland was made even more strange by being preceded by an eerie sunrise that brought a hazy, orange sky across much of Ireland and Britain. The orange light was filtering through a thick layer of Saharan dust that had been transported to the north by the trough of low pressure that steered Ophelia northwards. Adding to the haze was smoke from wildfires in Portugal and Spain that killed at least 32 people over the weekend.

Sixty-four people died in a wildfire in Portugal in June, and the country has declared a state of emergency in the northern region. "We are facing new (weather) conditions" due to climate change, Portuguese Interior Minister Constanca Urbano de Sousa said; she also

referenced the fires in California. "In an era of climate change, such disasters are becoming reality all over the world." Historic fires have burned much of the Amazon as well.

With the fire season still ongoing, Brazil has seen 208,278 fires, putting 2017 on track to beat 2004's record 270,295 fires. While drought (likely exacerbated by climate change) worsens the fires, experts say that nearly every blaze is human-caused.

The Amazon forest areas seeing the most wildfires have also seen rapid change in recent years, with high levels of deforestation, and especially forest degradation, as loggers, cattle ranchers, agribusiness and dam builders move in.

Scientists warn of a dangerous synergy: forest degradation is turning the Amazon from carbon sink to carbon source in some dry years, while globally, humanity's carbon emissions are worsening drought and fires. Brazil's push for Amazon agribusiness deepens the problem. Researchers warn that mega-fires could be coming unless trends are reversed.

This is not the first time such an event has occurred. In 2013 the same colony which numbered 20,196 pairs at the time failed to produce a single chick.

Heavy sea ice, combined with unusually warm weather and rain, followed by a rapid drop in temperature, resulted in many chicks becoming saturated and freezing to death. Antarctica as a whole has experienced a record low amount of summer sea ice but the area around the penguin colony has been an exception.

Speaking of starvation, something that millions of people, and animals, must struggle with globally, Oct 16 was World Food Day. Pope Francis received a standing ovation after his speech during which he called the link between climate change and hunger undeniable. The Pope called on governments around the world to acknowledge that climate change and migration were leading to increases in world hunger. "We are called to propose a change in lifestyle and the use of resources," Francis told the audience. "We cannot make do by saying 'someone else will do it.'"

"September 2017 was the planet's fourth warmest September since record keeping began in 1880. The only warmer Septembers came during 2015, 2016 and 2014."

Europe may see an increase in hurricanes as scientists are observing the predicted poleward migration in both the Northern and the Southern hemispheres of intensifying tropical cyclones. This is likely a consequence of human-caused global warming, including altered oceanic currents and warmer seas.

Ophelia was an extremely unusual storm and it broke some of the graphical displays used to view the forecasted storm at the National Hurricane Center. Scientists never planned for the possibility that an Atlantic hurricane or its identifiable remnants could make it so far to the northeast. As noted in Blog 4, we no longer live on Earth, we now live on Eearth where everything climate-related is different and potentially dangerous and disruptive.

Further evidence that climate change is having a devastating impact at the poles was observed by French scientists studying Adelie penguins on Antarctica. Thousands of Adélie penguin chicks in Terre Adélie died of starvation due to unusually thick sea ice that forced their parents to travel an extra 100 kilometers (62 miles) to find food. The colony of over 18,000 pairs of Adélie penguins suffered a "catastrophic breeding failure" with only two chicks surviving.

A recent UN report stated that for the first time in over a century, the number of chronically hungry people increased, rising by 38 million people between 2015 and 2016. The UN report noted that 815 million people suffered from chronic hunger in 2016, comprising about 11 percent of the world's population.

At the heart of this rise are climate change and human conflict, both of which drive food insecurity in poverty-stricken communities around the globe.

In a visceral reminder to world leaders on just how devastating the effects of climate change and conflict induced migration can be, Francis unveiled a marble statue of three-year old Alan Kurdi, a Syrian-Kurdish migrant who was found dead on the shores of Greece in 2015. The statue depicts an angel wailing above the boy's corpse. The Vatican said the piece represents the tragedy of human migration.

Around the world, social and political instability are on the rise. Since 2010, state-based conflict has increased by 60 percent and armed conflict within countries has increased by 125 percent. More than half of the food-insecure people identified in the UN report (489 million out of 815 million) live in countries with ongoing violence. More than three-quarters of the world's

chronically malnourished children (122 million of 155 million) live in conflict-affected regions.

At the same time, these regions are experiencing increasingly powerful storms, more frequent and persistent drought and more variable rainfall associated with global climate change. These trends are not unrelated. Conflict-torn communities are more vulnerable to climate-related disasters, and crop or livestock failure due to climate contribute to social unrest.

War hits farmers especially hard. Conflict can evict them from their land, destroy crops and livestock, prevent them from acquiring seed and fertilizer or selling their produce, restrict their access to water and forage, and disrupt planting or harvest cycles. Many conflicts occur in rural areas characterized by small holder agriculture or pastoralism. These small-scale farmers are some of the most vulnerable people on the planet. Supporting them is one of the UN's key strategies for reaching its food security targets.

Without other options to feed themselves, farmers and pastoralists in crisis may be forced to leave their land and communities. Migration is one of the most visible coping mechanisms for rural populations who face conflict or climate-related disasters.

Globally, the number of refugees and internally displaced persons doubled between 2007 and 2016. Of the estimated 64 million people who are currently displaced, more than 15 million are linked to one of the world's most severe conflict-related food crises in Syria, Yemen, Iraq, South Sudan, Nigeria or Somalia.

Displacement due to climate disasters also feeds conflict. Drought-induced migration in Syria, for example, has been linked to the conflict there, and many militants in Nigeria have been identified as farmers displaced by drought.

Before transferring to the Good News section of the Blog, here is some data on global weirding weather (courtesy of National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information(NCEI):

September 2017 was the planet's fourth warmest September since record keeping began in 1880. The only warmer Septembers came during 2015, 2016 and 2014.

Global ocean temperatures last month were the fourth warmest on record for any September, and global land temperatures were the third warmest on record. Record warmth was observed across parts of central and southern Africa, southern Asia and scattered across the western, northern, and southern Pacific Ocean, the Atlantic Ocean (off the southeastern coast of South America), the Norwegian Sea, Greenland Sea and Barents Sea, and across parts of the Indian Ocean.

Each of the first eight months of 2017 has ranked among the top four warmest months on record, giving 2017 the second highest January–September temperature in the 138-year record: 0.78°C (1.57°F) above the 20th-century average. This is behind the record year of 2016 by 0.13°C (0.24°F). This near-record warmth in 2017 is especially remarkable given the lack of an El Niño event this year. Global temperatures tend to be warmer during El Niño years, when the ocean releases more heat to the atmosphere. However, 2017 is almost certain to be the planet's warmest year on record that lacks any influence from El Niño, and Earth's four warmest years of the last century-plus are likely to be 2016, 2017, 2015 and 2014.

Two Category 5 Atlantic hurricanes caused billion-dollar weather disasters last month: Hurricane Irma and Hurricane Maria. Through the end of September, Earth had 21 billion-dollar weather events for the year, which is now a typical number for this point in the year. The year that ended with the most billion-dollar weather disasters in records going back to 1990 was 2013, with 41; that year had 33 billion-dollar disasters by the end of September. Last year, there were 28 billion-dollar weather disasters by the end of September; that year ended up with 31 such disasters. (Additional data on some of this year's billion-dollar weather disasters through the end of September is at the end of this Blog.)

As for good news on renewable energy: capturing just 2 percent of the wind would solve the planet's energy needs. Britain is the windiest country in Europe so it is at the forefront of this green revolution. Last month, the cost of renewable energy dropped dramatically to undercut by almost half the government's projections for 2025. At £57.50 per megawatt-hour (MWh), it is far cheaper than the state-backed price of £92.50 awarded in 2016 to Hinkley nuclear power station.

Since the government ruled out new onshore windfarms in England energy companies have been forced offshore making the UK the world's offshore energy leader. Allowed to develop beyond the vision of land-dwellers who see windfarms as a blot on the countryside, the turbines have grown steadily larger, as have the farms to which they belong. Dong's Hornsea Project Two will span 480 sq km.

One reason for the falling cost of wind energy is that the growing diameter of the blades. A turbine commissioned in 2002 swept 80 metres; in 2005, that figure rose to 90 metres; in 2011, it was 120 metres. By 2020, it will be 180 metres.

Of course, the supply chain has improved, and there have been engineering refinements. But put baldly, wind energy costs less, and will go on costing less, because the turbines are growing taller and the blades longer. The manufacturers of these machines are in a race to produce the largest.

There are technical challenges, too, such as the difficulty of storing the energy captured. Batteries for this purpose—such as the E.ON facility that opened in Sheffield last week—are still developing and are crucial to securing the supply, making it reliable. But still, the possibilities are immense.

Large turbines on the ocean offer certain advantages, but other opportunities are higher up. Wind turbines on kites are in research and development. The jet stream, for Caldeira, is the largest, most concentrated renewable energy source on the planet, 20 times as potent in every square metre as direct sunlight in the middle of the day.

As I've noted, the transportation sector is a major contributor to GHG emissions, and individually, we all emit CO₂ when we drive our cars. In Norway, 37 percent of its new cars are electric. They expect it to be 100 percent in just eight years (by 2025).

In December, the country hit 100,000 zero-emission EVs on the road, and they are projected to quadruple to 400,000 by 2020. These numbers are especially remarkable for a country of only 5.2 million people. Over five percent of all of Norway's cars are EVs, up from one percent two years ago. EVs may win on straight economics then, but the country, and others, has been considering outright bans.

The electric vehicle revolution is at a tipping point. Battery prices have been dropping much faster than predicted. China launched a massive scale up in both batteries and EVs in recent years. EV sales have been soaring worldwide. By 2025, more than 37 million fully electric vehicles are expected to be on the road globally, and those EVs will be cost competitive without subsidies.

No wonder every country is racing to be the EV leader, or, rather, every country but one. Trump is committed to killing domestic climate action responses and slashing federal clean energy funding. He continues to favor the enemies of EVs, such as Big Oil and Russia/Vladimir Putin. If Trump keeps his campaign pledge to promote oil rather than clear air, U.S. workers could miss out on one of the biggest new job-creating industries of the next quarter century.

Lastly, Trump recently made three hires you should know about.

Kathleen Hartnett White was placed at the head of the Council on Environmental Quality. She is an unabashed defender of fossil fuels who has argued against the endangerment finding and the utility of the Endangered Species Act. If confirmed to head the CEQ, she would be coordinating environmental efforts across all federal agencies.

She has decried regulation of carbon dioxide, which she calls "the gas of life," and co-authored last year's paean to the fracking boom, "Fueling Freedom: Exposing

the Mad War on Energy." Her co-author, economist Stephen Moore, founded the Club for Growth, the political action group that weaponized the primary process to successfully move the Republican party to the right over the past two decades.

"An invisible, harmless trace gas in the Earth's atmosphere, CO₂ is a plant food," White said last year in a Q&A with the Orlando Sentinel.

In her 2014 monograph, "Fossil Fuels: The Moral Case," she wrote: "Humanity's use of fossil fuels has released whole populations from abject poverty." She has also promoted tactics for undermining the Endangered Species Act, claiming its protections for endangered wildlife imperil prosperity.

Trump announced his nomination of Barry Myers, the CEO of private weather company AccuWeather, to lead the U.S. National Oceanic and Atmospheric Administration (NOAA), the country's foremost scientific agency for oceanic and climate research. Mr. Myers has potential conflicts of interest, especially his support of a highly criticized bill that would shift taxpayer-funded National Weather Service data to for-profit companies (such as AccuWeather).

AccuWeather's business model takes NOAA data and products on weather, developed with taxpayer dollars, and delivers them to the public for a fee. Myers has been a strong advocate against NOAA having the capability to provide such products directly to the public, hence the rather boring form of NOAA forecasts which is interpreted and commoditized by companies like AccuWeather.

AccuWeather has been active in efforts to undercut the role of NOAA. In 2005, AccuWeather, under the leadership of Myers' brother Dr. Joel Myers, worked with Senator Rick Santorum on a bill to severely restrict the National Weather Service's ability to provide weather forecasts to the public. The company donated to Santorum's then Senate campaign and has been vocal about their interest in downsizing NOAA in the interest of privatizing weather forecasting.

Sen. Bill Nelson (D-FL), who now serves as the ranking member of the Senate Commerce Committee, successfully blocked the bill from consideration.

"We've had ten hurricanes in ten weeks, I want to make absolutely sure any NOAA administrator will put the public first in delivering freely available weather forecasts," Nelson said. "We can't afford to have someone in this position that might be tempted to feather their own nest by privatizing the National Weather Service."

NOAA has other crucial roles besides issuing daily forecasts. The agency produces important climate change research and manages the nation's fisheries.

Trump's 2018 budget proposal cuts NOAA's budget by 17 percent to \$4.8 billion, including cutting \$230 million for grant and education programs. Cutting basic research into the oceans, atmosphere, and climate, the taxpayer-funded research done by NOAA and NWS, will lead to less reliable weather modeling by private firms like AccuWeather as well as federal models like the Global Forecast System.

Trump placed Drue Pearce as the acting administrator for the Pipeline and Hazardous Materials Safety Administration (PHMSA), an agency in the Department of Transportation responsible for ensuring oil and gas pipeline integrity. However, she is also associated with a company specializing in the sale of oil spill equipment. At the time of the appointment the Administration had yet to nominate an administrator for the agency, so Pearce became the acting administrator.

Business records filed in the state of Alaska show that since 2009 Pearce and her husband, Michael F. Williams, have owned Spill Shield Inc., an Anchorage-based company selling equipment for oil spill responses. Mr. Williams is a former oil executive who worked at BP for many years.

Both Pearce and Williams are also registered in Alaska as owning Cloverland LLC, which shares the same Anchorage address as Spill Shield. Company records for Cloverland indicate it is involved in the "sale of environmental response equipment."

Government ethics rules define a personal financial interest as instances in which a government employee's immediate family members—including spouses—receive financial gain that may compromise the employee's service of the public interest.

Jeff Hauser, executive director of the Revolving Door Project at the Center for Economic and Policy Research, said that Pearce's situation raises serious red flags.

"It's important and disturbing to learn that a senior Trump administration official has a significant financial interest in oil spills. The fact that it's an appointee's spouse who owns a company, rather than the appointee, does not shield them from conflicts of interest scrutiny in either common sense or the law."

Ms. Pearce did not have to be confirmed by the Senate and therefore did not have to file an Ethics Agreement.

Here Is More Data on Recent Storms, and Record Weather Events:

Hurricane Harvey, U.S., 8/25 – 9/2, >\$20 billion, 60 killed

Hurricane Irma, Caribbean, Bahamas, SE U.S., 9/5 – 9/12, >\$30 billion, 124 killed

Hurricane Maria, Caribbean, 9/18 – 9/21, >\$20 billion, 78 killed

Flooding, China, 6/22 – 7/5, \$7.5 billion, 141 killed

Flooding, China, 7/13 – 7/17, \$4.5 billion, 20 killed

Flooding, Peru, 1/1 – 4/1, \$3.1 billion, 120 killed

Severe Weather, Rockies, Plains, U.S., 5/8 – 5/11, \$2.6 billion, 0 killed

Drought, China, 5/1 – 8/31, \$2.5 billion, 0 killed

Tropical Cyclone Debbie, Australia, 3/27 – 4/5, \$2.4 billion, 14 killed

Drought, Italy, 1/1 – 7/31, \$2.3 billion, 0 killed

Severe Weather, Plains, Southeast, Midwest U.S., 3/26 – 3/28, \$2.3 billion, 0 killed

Severe Weather, Midwest, Plains, Southeast MS Valley U.S., 4/28 – 5/01, \$2.0 billion, 20 killed

Drought, Somalia, Ethiopia, Kenya, 1/1 – 3/31, \$1.9 billion, hundreds killed

Tropical Storm Nanmadol, Japan, 7/4 – 7/6, \$1.0 billion, 37 killed

Winter Weather, Plains, Midwest, Southeast, Northeast U.S., 3/13 – 3/15, \$1.0 billion, 11 killed

Arctic sea ice extent during September 2017 was the seventh lowest in the 38-year satellite record. The record-low extent years were 2012 and 2007. The five lowest Arctic sea ice extents were measured in September 2012, 2007, 2016, 2011 and 2015.

Sea ice surrounding Antarctica had the second lowest extent on record in September 2017 and has been at record- to near-record lows since September 2016.

Notable Global Heat and Cold Marks Set for September 2017

Hottest temperature in the Northern Hemisphere: 50.3°C (122.5°F) at Mitribah, Kuwait, Sept. 3

Coldest temperature in the Northern Hemisphere: -37.0°C (-27.2°F) at Summit, Greenland, Sept. 3

Hottest temperature in the Southern Hemisphere: 42.8°C (109.0°F) at Birdsville, Australia, Sept. 27

Coldest temperature in the Southern Hemisphere: -78.3°C (-108.9°F) at Concordia, Antarctica, Sept. 2

Major Weather Stations That Set (Not Tied) New All-Time Heat or Cold Records in September 2017:

So far in 2017, 168 major weather stations have set records for the all-time highest temperature ever measured and 17 have set records for the all-time lowest temperature ever measured. Here are some of the records for September 2017:

San Francisco (California) max. 41.1°C (105.98 F),
Sep. 1

San Luis Obispo (California) max. 46.1°C (114.98 F),
Sept. 2

Conceicao do Araguaia (Brazil) max. 41.5°C (106.7 F),
Sept. 19

As of October 17, 3 nations have set or tied all-time national heat records in 2017 and two have set or tied all-time cold records. National all-time monthly temperature records so far in 2017 have numbered 44 for maximum temperature and two for minimum temperature. (The source for international weather records is Maximiliano Herrera, a top climatologist, who maintains a comprehensive list of extreme temperature records for every nation on his website.)

All-Time National Heat Records Set or Tied in 2017

Macau: 102.2°F (39.0°C) at Ka Ho, Coloane Island,
Aug. 22 (tie)

Hong Kong: 102.2°F (39.0°C) at Wetland Park, Aug. 22

Vatican City: 105.3°F (40.7°C) at Roma Macao AWS,
Aug. 2 (tie)

United Arab Emirates: 125.2°F (51.8°C), at Mezaira,
July 30

Spain: 117.1°F (47.3°C), at Montoro AEMET, July 13

Iran: 128.7°F (53.7°C), at Ahwaz, June 29

Oman: 123.4°F (50.8°C), at Qurayyat on May 30 and at
Joba on May 31 (tie)

Pakistan: 128.3°F (53.5°C), at Turbat on May 28 (tie)

Guinea: 113°F (45.0°C), at Koundara, March 29 (tie)

Chile: 113°F (45.0°C), at Cauquenes, Jan. 26

Cocos Islands (Australia): 91.0°F (32.8°C), at Cocos
Island Airport, Feb. 23 (tie with April 8, 2015 and
April 11, 1998)

All-Time National Cold Records Set in 2017

United Arab Emirates: 22.3°F (-5.4°C) at Jabel Jais,
Feb. 3

Qatar: 34.7°F (1.5°C) at Abu Samra, Feb. 5

Other Records Set in 2017

Asian record of highest temperature ever recorded in
April: 50.0°C (122 F) at Larkana, Pakistan, April 19

World record of highest temperature ever recorded
in May (tied): 53.5°C (128.3 F) at Turbat, Pakistan,
May 28

Asian record of highest temperature ever recorded in
June: 53.7°C (128.66 F) at Ahwaz, Iran, June 29

Northern Hemisphere record of lowest temperature
ever recorded in July: -33.0°C (91.4 F) at Summit,
Greenland, July 4

It's Essential We Learn to Recover From Massive Storms

By Carl R. Howard

October 29, 2017 was the five-year anniversary of Hurricane Sandy hitting the New York City area. It is important to recall that this storm crippled the region, killed over 100 people, cost billions in lost real estate, business and infrastructure and billions more have been spent fortifying for the next storm. But many homeowners and businesses have still not recovered and many storm-protection projects have yet to begin. It is essential that we learn how to recover from such storms.

A Rutgers University report found that New York City could experience Sandy-like storm surges every five years by the middle of this century. If Sandy recovery efforts are any indicator, it means we won't finish repairs from one storm before another hits. Hopefully, the various stakeholders in the Sandy recovery efforts, from federal to state to local actors, have learned a great deal over the last five years, because it is certain that we will have to do this all over again. Any of the storms that destroyed much



of Houston, Florida and Puerto Rico could easily have devastated New York City too.

Congress allocated about \$50 billion to help the region rebuild in 2013. Much of the billions in federal, state and local money spent so far on storm protection in the region has gone toward smaller projects, like building dunes and bioswales, a landscape feature that uses pockets of dense vegetation to prevent flooding.

In New York City, three seawall-like projects to protect flood-prone areas remain in the planning stage. One Lower East Side project contemplates construction of a massive berm hidden by a park. Another project on Staten Island includes the U.S. Army Corps of Engineers, New York State and City, and envisions a sea wall covered with sand to appear as a sand dune. A third major New York City project involves plans for a reinforced dune and expansion of the beach off Rockaway Peninsula, Queens. These projects are estimated to cost \$1.6 billion and are fully funded. Yet no work has begun. The Staten Island

and Lower East Side projects won't be completed for several years, while the Rockway project is still awaiting federal approval.

Water from the East River could still flood city streets and basements because the idea of building berms around Lower Manhattan is still in the planning stages. The first phase of that plan, known as the Big U, would involve installing walls and gates attached to existing structures, like the elevated FDR highway.

At NYU Langone Medical Center in downtown NYC, where a massive power failure forced the hospital to evacuate vulnerable patients during Sandy, a \$1.1 billion FEMA grant has been used for upgrades. Critical equipment has been moved from the basement to higher floors, flood barriers now surround the hospital and backup generators have been installed.

Most Sandy-related deaths in New York City occurred in areas under a mandatory evacuation order. Many people either chose to ignore the order or felt they had nowhere to go and no way to escape. Future evacuation orders may be enforced but it is not clear how.

The New York City Housing Authority says 80,000 residents in more than 400 buildings were "significantly affected" by Sandy. Many are still feeling the impact today.

One reason for the slow pace of repairs is that FEMA took three years to award a \$3 billion grant for the recovery work. Thus NYCHA couldn't use that money until this year. Work now being done at 33 developments across Brooklyn, Queens, Manhattan, and Staten Island includes repairs for Sandy damage, replacing temporary boilers installed after the storm with permanent ones, and resiliency work to prevent extensive damage and power outages in future storms. Of the 33 projects, 17 are currently under construction and one is completed. NYCHA hopes to begin construction on the remaining projects by the end of the year.

For private housing, in June 2013, Mayor Bloomberg announced the Build It Back Program, a city initiative to help homeowners build or renovate their homes because of damage from Sandy or elevate them to help stay above the next storm. The well-intentioned program has been widely criticized for being slow and bureaucratic. On the third anniversary of Sandy, de Blasio promised to complete every construction project by the end of 2016. That didn't happen. Nearly 1,000 families have been waiting five years for construction to be completed. De Blasio's new target finish date was the spring, 2018.

A massive amount of work remains to repair damage from Sandy. Repairs on the Canarsie Tube under the East River will require the L train to shut down for 15 months beginning in April 2019 which will affect 225,000 daily weekday commuters. The MTA's \$7.6 billion program in response to Sandy includes installing submarine doors, Kevlar curtains and mechanical gates to plug more than 3,000 openings into the subway below 14th Street.

Daniel A. Zarrilli, the city's chief resilience officer, said construction could begin on that segment, estimated to cost \$740 million, by the end of next year and would take several years to complete.

Five years after Sandy other tunnels still need repairs. Currently, #2 and 3 trains don't run between Manhattan and Brooklyn on weekends as the MTA repairs the Clark Street Tube. Work started in the spring of 2017 and was expected to be completed in the spring of 2018. The agency also plans to close the F train's Rutgers Tube on weekends starting in 2022 for similar repairs. And all that repair work says nothing of the "fortify" bit of the Fix & Fortify plan, which involves installing rapidly deploying covers over 5,600 street openings so stations don't flood, and on which progress has been painfully slow. Related

The longest recovery may be Amtrak's which plans to wait eight more years to begin repairs to its East River tunnels, which are heavily used by the Long Island Rail Road. It plans to wait for the East Side Access project to be completed so LIRR trains have another route into Manhattan while the current tunnels are repaired. Amtrak doesn't plan on repairing damage from Sandy until 13 years after it hit.

Sea Bright, N.J. is a coastal community in Monmouth County that was devastated by Sandy. The town's response has been to fortify its sea wall, but many say the focus should instead be on moving people out of harm's way.

The traditional response to recovery is to build it back. This serves traditional interests of real estate development and generates taxes. But we need to question whether this in the best long-term interest of the state or the communities or the homeowners who are going to be right back where they were, vulnerable to the next inevitable storm.

With sea-level rise and more frequent hurricanes, sheltering in place is not an effective strategy. Political leaders will need to make difficult decisions to incorporate the lessons of Sandy and speed future recovery efforts. "Managed retreat" is a topic you will be hearing more about.

The scientific consensus is that future destructive storms are inevitable given the amount of carbon in the atmosphere. World CO2 emissions as of 2012 were about 45 billion metric tons. I have no idea how to make that number real except to say 45 billion metric tons is a lot of tons. Enough to have an effect on the planet's climate. By 2030 the high estimate is that world emissions will be 55bmt, the low estimate 50bmt. Under the Paris accords, if all countries meet their pledges (the two last holdouts, Nicaragua (which wanted a stronger agreement) and Syria, have signed the Accord, leaving one country as a hold out, U.S.), the high estimate is still 55bmt (as explained below), the low: 50bmt by 2030. To stay below the two degree Celcius level to avoid catastrophe, world

emissions must decrease at least to the high level of 40bmt, if not the low estimate of under 30bmt by 2030. And then decrease from there.

Here's a snapshot for the U.S., EU, China and India:

	Current ('14) emission	High Estimate ('30)	Low	Paris High	Paris Low	2 Degrees High	2 Degrees Low
World	45 bmt	55	50	55	50	40	30
US	6.5 bmt	6.5	6	<6	5	4	<2
China	11 bmt	>13	<12	>14	12	10	7.5
India	2.5 bmt	>5	<5	6	5.5	6.5	4

The sobering reality of these numbers is that even if all countries meet their Paris pledges (look at the low estimates for Paris: (50, 5, <4, 12, 5.5) they do not meet the high target to stay below 2 degrees C (40, 4, 2.5, 10, 6.5 – with the possible exception of India). Total world emissions even under the Paris Accord are predicted to rise (from current 45bmt to at least 50bmt) and looking at the projected numbers for China and India helps explain this inconvenient truth. In 2014 China and India emitted around 11 and 2.5 bmt respectively. Their low estimated emissions under the Accord is <12 and 5.5, but to stay below 2 degrees C these numbers need to be reduced at least down to 10 and 6.5 (again, India may reach its target but its push to modernize may very well produce more emissions and it may be that the low estimate, 4bmt, is the more accurate figure). These numbers would be even worse but for the gains being made in solar, wind and other non-carbon energy sources. Note: no industrial nation is on target to meet its Paris pledge and major emissions cuts will be necessary to not exceed two degrees C warming.

One problem in assessing progress is that the numbers reported by individual countries are hard if not impossible to verify. There was talk at the global climate meetings such as the one in Bonn, Germany (which I will address in my next Blog) to undertake a major effort in 2018 to clarify and verify the accuracy of these numbers. In all likelihood the amount of emissions is much higher than reported. Increasing the transparency of pledges would make it easier for countries to pressure each other do more, which is how the Paris Accord was designed.

China is hard to forecast. Its Paris pledge was to reach peak emissions levels by 2030 and then decline, but it may have already peaked (its emissions reporting is suspect). It has canceled plans for 100 coal plants and is investing heavily in cleaner sources like solar and wind (as well as nuclear). The country also plans to sell millions of electric vehicles in the years ahead.

To cut down on carbon emissions, we need to cut down on burning coal, and Britain is doing just that. Its last coal-burning plant may close by 2025. This is a startling development for the nation that founded an industrial revolution powered by coal.

For four decades the Drax Power Station has been one of the world's largest coal power plants, often generating a tenth of the UK's electricity. It has been the powerhouse behind Britain's 250-year love affair with coal—the fuel that built the country's empire and industrialized the world. Henceforth Drax will only burn biomass—mostly wood chips imported from the southern U.S.

When Drax opened in 1974, Britain got 80 percent of its electricity from burning coal. As recently as five years ago, the figure was 40 percent. But last year, it was 9 percent, and this summer coal supplied less than 2 percent of Britain's electricity. On April 21, 2017, for the first time, the British power grid went 24 hours without coal.

The zing in the power lines now comes almost entirely from natural gas, nuclear, and growing networks of giant wind turbines and solar farms. Coal now only provides occasional back-up energy in the U.K., mostly on sunless and wind-free winter days. The next important step is to replace coal as a backup power source with large batteries, and, as I have written, this is happening.

The collapse of coal, the dirtiest of the fossil fuels, has resulted in a sharp drop in Britain's CO2 emissions from electricity generation. Those emissions fell 50 percent between 2010 and 2016. The average Briton is now responsible for only about a third the CO2 emissions of the average American.

The trend away from coal is becoming familiar in many developed nations. It is an important reason why global CO2 emissions have not risen in the past three years. Coal's share of U.S. electricity generation, for instance, has fallen from 53 percent in 1997 to 32 percent last year. Trump's pro-coal rhetoric will not change that given the cheap price of natural gas, solar and wind energy. In February this year, a month into the Trump era, operators announced plans to shut down the largest coal-burning power plant in the American West, the 2,250-megawatt Navajo Generating Station in Arizona.

With coal came pollution. London became known as the "big smoke." In 1952, an estimated 10,000 people died in the capital during a "peasouper" smog. Long before the world became seriously concerned about coal's contribution to climate change, Europe was worried about acid rain caused by coal burning. British power stations were discovered to be killing fish a thousand miles away in the lakes of Norway. The lingering effect of Britain's coal use is that Britain is responsible for 6 percent of all the industrial CO2 in the atmosphere today—more per head of population than any large nation, the U.S. included.

Lahore, Pakistan, is today experiencing this same coal-based horror. Thousands die each year due to

inhalation of PM 2.5, tiny particulate matter that enters deep into the lungs, as well as mercury and other coal-related pollutants. Additional deaths occurred on Lahore's highways recently due to zero visibility from smog.

But the big story is the rise of renewables. In particular, Britain has pioneered giant offshore wind farms, with each turbine able to generate eight megawatts. The price of energy from offshore wind has halved in five years, and it is now lower than either nuclear or gas.

Offshore wind energy is booming across most of Europe. As a result, 2016 was the first year during which Britain got more energy from wind than coal, 11.5 percent compared to 9.2 percent, with £17.5 billion more investment earmarked in the next four years. British wind energy peaks in winter, while solar generates more in summer. In 2016, British solar produced more power than coal for the six-month period from April through September.

Coal's collapse in Britain reflects a Europe-wide trend. Coal-power production within the EU has fallen by 20 percent in the past decade. France will close its last coal plant in 2023. Analysts of the Paris climate accord say that to meet its targets, the EU will have to close all of its coal-fired power stations by 2030—a goal that now seems attainable.

But there are holdouts, notably Poland and Germany, which together now burn half the EU's coal. In Germany, the decision to abandon nuclear power after the Fukushima accident in 2011 has resulted in a resurgence in burning dirty lignite coal raising the country's CO2 emissions and unleashing environmental protests and mine occupations this summer.

One consequence of the collapse of coal has been a halt on developing carbon capture and storage (CCS) technology. The last climate assessment from the UN's Intergovernmental Panel on Climate Change in 2014 foresaw the large-scale future deployment of CCS as a prime means of curbing emissions. But since then several planned demonstration projects have foundered.

Germany dropped the idea amid environmental concerns. An EU-funded Dutch scheme died in June when private partners pulled out. That announcement came only days after U.S. utilities gave up on a clean-coal project incorporating CCS at Kemper county in Mississippi.

On a happier note, wind energy provided 206 percent of Scotland's entire electricity needs on Oct. 2. On that day wind power provided 86,467 megawatt hours (MWh), more than double the country's total daily electricity needs. The electricity was enough to power 7.116 million homes, about three times the total number of Scottish households.

Wind energy generation was impressive on a monthly basis too, with wind turbines providing 1,108,862 MWh of

the total 1,768,505 MWh electricity consumption during September (meeting 63 percent of the country's monthly electricity needs). And, from January to June 2017, wind turbines generated enough electricity to power 124 percent of Scottish households.

Seeing the potential of clean, non-carbon energy, and consistent with public opinion, Scotland's Parliament announced that fracking will be banned.

Wales' Environment Secretary wants 70 percent of the nation's electricity to be generated by renewable sources by the year 2030. While the Welsh usage of renewables is only 32 percent, that is more than twice that of the United States (15 percent).

Other countries in the UK are pushing to rapidly expand renewable energy investment. Ireland introduced legislation to divest government funds from coal and oil, a first step in moving the country away from fossil fuels. Scotland has also embraced renewable infrastructure with efforts to increase wind, solar, and tidal energy generation. Scotland has set its own target of 100 percent clean energy by 2020.

Scotland has also officially switched on the Hywind Scotland, the world's first floating wind farm. Hywind will provide clean energy to over 20,000 homes. The 30 megawatt wind farm consists of five turbines and is located 25 kilometers (25 miles) offshore.

Batwind, a Lithium battery that can store one megawatt-hour of power, is linked to the Hywind to help mitigate intermittency and optimize output. Typical offshore wind farms are installed on seabeds in relatively shallow seas. The advantage of a floating system allows countries like Japan, the U.S. West Coast and Mediterranean, where seabeds drop steeply off the coast, to utilize the technology. Hywind can be used for water depths up to 800 meters, thus opening up areas that so far have been inaccessible for offshore wind.

The project cost about 200 million pounds (\$263 million) to construct. The cost of onshore and offshore wind has declined significantly in recent years, with the UK's latest renewable energy auction dropping to 57.50 pounds (\$76) per megawatt-hour.

Floating wind is expected to follow a similar downward trajectory over the next decade making it cost competitive with other renewable energy sources. Statoil hopes to reduce the costs of energy from the Hywind floating wind farm to €40-60/MWh (\$47-76) by 2030. Up to 80 percent of the offshore wind resources are in deep waters (+60 meters) where traditional bottom fixed installations are not suitable. Floating offshore wind is expected to play a significant role in the growth of offshore wind going forward.

Scotland's first minister announced plans to end the sale of new gas and diesel-powered cars by 2032 and

fast-track the development of a country-wide charging network for electric vehicles.

Scotland also set a world record for producing energy from tidal power. Tidal energy harnesses the natural ebb and flow of the ocean, and the technology generated enough electricity last month to power 2,000 Scottish homes using two turbines. Tidal power uses massive, submerged turbines that function as underwater windmills to produce electricity, pivoting into the current and spinning as the tide goes in and out. (A similar pilot project recently was run in the East River off New York City powering a store on Roosevelt Island.)

Because water is over 800 times more dense than air, tidal energy rotors can also be significantly more compact than those used for wind turbines, which have diameters up to 300 feet.

The company, Atlantis Resources Limited, produced over 700 megawatt hours in August at its flagship underwater MeyGen production site in the north of Scotland. Atlantis claims its tidal turbines turn slowly enough that they pose no threat to marine life, and sea vessels can pass over the tidal field unobstructed.

In the U.S., additional incentive to close dirty coal plants came from former New York City mayor Bloomberg. His charity will give \$64 million to help accelerate the retirement of coal plants in the U.S. Bloomberg Philanthropies has given \$110 million to the Sierra Club's Beyond Coal campaign, which aims to shutter two-thirds of U.S. coal-fired power plants by 2020. Despite Scott Pruitt's proclamation that the Clean Power Plan rollback means the "war on coal is over," market forces say otherwise.

Major utilities across the U.S. continue to move away from coal-fired power. A Texas utility confirmed plans to shutter a San Antonio coal-fired power plant; a coal operator announced it would idle a western Kentucky mine, and the government gave hundreds of thousands of dollars to the Navajo and Hopi tribes in preparation for the likely closure of the coal-fired Navajo Generating Station.

Bloomberg declared his actions as a "war on coal," embracing a term Republicans use to attack clean-energy advocates, saying that the Trump administration and EPA's Pruitt are wrong to say that the war is being fought mainly in Washington, D.C. "The war on coal is a fight for America's health, for our economy and our environment, and our competitive place in the world. And it's a fight we're going to win, no matter what anybody in Washington says." "This is to save American lives and save the American economy. This is our future, and going in the wrong direction is just needlessly inflicting pain on all of us, and it has to stop."

In April, a survey by the Institute for Energy Economics and Financial Analysis found that 46 coal-burning units at 25 power plants across 16 states will close or significantly reduce production by 2018. Milwaukee-based WEC Energy Group also plans to reduce carbon dioxide emissions to the levels set by Obama regulations despite Trump's roll-backs.

A report from Bloomberg New Energy Finance projects that about two-thirds of coal-fired plants will close by 2040, while gas-fired electricity may rise by 22 percent and renewables could jump a stunning 169 percent. You don't need a weatherman to know which way the wind blows (Dylan).

NEW YORK STATE BAR ASSOCIATION

COMMITTEE ON ATTORNEY PROFESSIONALISM AWARD FOR ATTORNEY PROFESSIONALISM

This award honors a member of the NYSBA for outstanding professionalism - a lawyer dedicated to service to clients and committed to promoting respect for the legal system in pursuit of justice and the public good. This professional should be characterized by exemplary ethical conduct, competence, good judgment, integrity and civility.

The Committee has been conferring this award for many years, and would like the results of its search to reflect the breadth of the profession in New York. NYSBA members, especially those who have not thought of participating in this process, are strongly encouraged to consider nominating attorneys who best exemplify the ideals to which we aspire.

Nomination Deadline: **October 12, 2018**

Nomination Forms: www.nysba.org/AttorneyProfessionalism/



World Leaders Met in Bonn to Discuss Climate Change

By Carl R. Howard

For the 23rd time world leaders gathered, this time in Bonn, Germany, to try to agree on an approach for meaningful advances in mitigating and adapting to climate change. Official delegations represented 195 countries. Only the U.S. representatives attended on behalf of a country not intending to stay in the Paris accord. And while the other countries proposed emissions reductions and rapid movement toward carbon-free, renewable energy, the U.S. representatives included members of the fossil fuel industry who spoke on behalf of the U.S. promoting continued use of carbon-emitting fossil fuels. The U.S. also advocated the continued use of nuclear power.

Unofficial American attendees, including Al Gore, Jerry Brown and Michael Bloomberg, who insisted that Trump's dismissal of climate policy doesn't represent the country, writ large that plenty of cities, states, universities and businesses are still doing their part to cut emissions and that Americans still very much want to tackle this problem. But Trump administration officials showed up to reiterate that they intended to leave the Paris agreement and that the rest of the world was naïve in thinking fossil fuels could be phased out quickly or easily. It was by far the most attended and talked-about event at Bonn, with hundreds of people waiting in line to get in (and protest).

George David Banks, Trump's international energy adviser, made it clear that the White House, not Democratic governors like Jerry Brown or Andrew Cuomo, spoke for America. When asked about the fact that blue states committed to tackling climate change represented 130 million Americans, he claimed, "I represent something like 300 million Americans."

After 22 prior meetings, the inadequate goal of this meeting was to get countries to begin drafting rules and processes for translating the goals of the Paris agreement into action. Thus drafting rules is just beginning on an Agreement that is itself totally inadequate to keep the planet from warming beyond 2 degrees C. Current mitigation pledges put the world on pace for 3 degrees C (5.4 F) of warming or more this century, a drastic change that would reshape global coastlines, put many populated islands underwater, destabilize ice sheets in Greenland and Antarctica, drastically raise sealevels and usher in a new era of deadly heat waves, floods, droughts, famine, disease, conflict, refugees and warfare.

Climate scientists gave a presentation to the conference on the vast task ahead of them. To stay below 2 degrees C of warming, global GHG emissions would likely have to peak in the next few years and then be cut by half every decade down to zero by midcentury. Repeat, down to zero by midcentury.

The scale of that transition is staggering. Virtually every coal plant around the world would need to be phased out (which is happening in the U.S. largely due to natural gas and fracking, but that too would need to be phased out) or outfitted with carbon capture technology (which is not happening large scale) within decades. Electric vehicles would need to be the primary mode of transportation (which is happening; the Chinese government announced that it would expand its domestic market for electric vehicles to seven million cars by 2025, a move spurred in part by Chinese concerns over air pollution in cities, and see Blogs 4, 5 and 6 on the positive trend in EV growth), and the world's power grids would need to be virtually emissions-free (which is happening based on wind and solar investment, but needs to happen bigger and faster and battery technology needs to improve to store the energy). Technology that barely exists today to suck carbon dioxide out of the atmosphere may need to be deployed on a huge scale.

And while the participating countries all made pledges as to when they'd reduce GHG emissions and how much, there remains much work to be done to verify if such reductions would in fact be realized. That is the next step for next year's meeting.

The existing tension between the developed and developing nations was evident in Bonn. Developed countries are supposed to be giving money and technology to developing countries so development can be based on renewable energy and advanced technology. But this is not happening fast enough or at levels adequate to meet demand. Developing countries pushed hard for more transparency on what the developed countries claimed to be providing as climate aid, but got nowhere. That angered a number of developing countries, particularly since Trump has said the U.S. will no longer contribute to the Green Climate Fund for global warming assistance. China argued that the Paris agreement "rule book" should hold developed nations to higher standards than developing countries (based on Environmental Justice concerns I noted in Blog 3).

Island nations and other vulnerable countries were disappointed that wealthy nations had opposed proposals to compensate countries under severe threat by climate change. The leader of Palau called CC a "life or death" issue, "a moral question, and it requires a moral answer."

The world is still largely dependent on the dirtiest of all fossil fuels, coal. At the conference scientists reported that global carbon dioxide emissions would most likely rise in 2017 after a three-year plateau, in part because of a rebound in Chinese coal consumption. Germany, too, is burning coal as it has phased out its use of nuclear power. After declaring that "climate change is an issue determining our destiny as mankind," Angela Merkel



acknowledged that Germany was likely to miss the goals it had set itself for cutting greenhouse gas emissions by 2020. Leaders from the EU also acknowledged it is likely to fall short of its 2030 emissions goals; they will push to enact new legislation on increasing clean energy and efficiency.

The International Energy Agency reported that coal's "boom years" are over, as more and more countries start shifting to cleaner sources of electricity, including natural gas, wind, and solar. And 19 countries vowed to phase out their coal use by 2030.

After two weeks, negotiators said they had made headway on creating a formal process under the 2015 Paris agreement in which world leaders would regularly and publicly detail the efforts they are making to address CC, specify areas where they are falling short, and push each other to do more. Which sounds like a plan for bickering and finger-pointing. Participating countries plan to submit newer, stronger climate pledges to the United Nations by 2020.

In the U.S., a coalition of cities, states, companies and universities vowed to meet the commitments of the Paris agreement despite Trump's promise to withdraw from the deal. Former NYC Mayor Bloomberg is an active member of the coalition called America's Pledge. The group consists of 20 U.S. states and more than 50 major cities. But the group acknowledged that any effort to meet the Paris accord's carbon-reduction commitments by 2025 requires federal action.

Meanwhile, Trump disbanded the Community Resilience Panel for Buildings and Infrastructure Systems as it was created by Obama in 2015. It was a cross-agency group created to help local officials protect their residents against extreme weather and natural disasters. It was one of the last federal bodies that openly talked about climate change in public. The group is the latest in a series of federal climate-related bodies to be altered or terminated since Trump took office. In June, Trump severed climate scientists from EPA's Board of Scientific Counselors. In August, Trump ended the advisory committee attached to the National Climate Assessment, the quadrennial review of climate science. Trump has called climate change a "hoax" designed to make the U.S. less competitive with China.

The Panel was the federal government's primary external engagement for resilience in the built environment. The Panel included representatives from EPA, the Federal Emergency Management Agency and other departments, as well as city planners and outside experts. The group advised local officials on making buildings, communications, energy and water systems, and transportation more resilient to severe weather and climate change. That mission made the group especially vulnerable.

Brendan Doyle, who was the EPA's representative to the Panel until he retired in August, said the idea for the Panel came from Superstorm Sandy in 2012. "It was a way of helping communities not only through the recovery process, but to help them adjust to a new normal, in ways that would make them more resilient to the next disaster." With federal aid increasingly thin, communities must depend on cash-strapped states and after-the-fact federal disaster aid. As Houston, Florida and Puerto Rico made clear, the current system is inadequate. Yet there is no plan to protect increasingly vulnerable U.S. communities.

Similarly, the State Department and the Interior Department sent high-level political officials to address a recent conference in Texas sponsored by the Heartland Institute, which rejects the scientific consensus that climate change is occurring and driven by anthropogenic emissions. Jim Lakely, a spokesman for the Heartland Institute, said, "Carbon dioxide is not a pollutant and it is not the driver of global warming." "So there is no moral case for restricting the use of fossil fuels, especially because that is vital to raising the quality and length of life of the world's poorest people." Scott Pruitt sent a video message of support. (Elsewhere EPA scientists were denied permission to speak at a different conference.)

"We have tremendous natural resources, from coal to natural gas to oil, to generate electricity in a very cost-effective way," Mr. Pruitt told the Heartland conference. "We should celebrate that and be good stewards."

Yet 70 percent of Americans believe global warming is occurring, according to a Yale University survey, and more than 60 percent say they are at least "somewhat worried" about its effects. "There's a debate in the United States between the denialists who pooh-pooh any thought about climate change and the catastrophic dangers it portends, and those who agree with the scientific academies of every country in the world that we're facing an existential threat and we have to do something about it," said Governor Brown.

For the first time since taking office on Dec. 7, EPA Administrator Scott Pruitt testified before the U.S. House Energy and Commerce Subcommittee on Environment addressing questions about his controversial handling of the agency. Pruitt told lawmakers he plans to replace the Clean Power Plan—the Obama administration's core legislation to cut carbon emissions—rather than just repeal it. He said he would conduct a critique of a key finding that underpins climate change law using a "red team, blue team" exercise as soon as January. This exercise targets EPA's 2009 "endangerment finding" that carbon dioxide is a harmful pollutant and provides the scientific basis for federal regulation of GHG and the Clean Power Plan. Pruitt has long opposed the finding, arguing in court that the work of the Intergovernmental Panel on Climate Change, which brings together thousands of scientists from around the world to synthesize the latest science on climate change, is flawed.

The endangerment finding has been in the crosshairs of certain fossil fuel interests, including the conservative think tank Heartland Institute and Bob Murray, CEO of the largest private coal company in the United States, which have pushed Pruitt to review it.

The Republican majority thanked Pruitt for his efforts to engage with state regulators and to roll back regulations. Democrats questioned Pruitt about growing influence within the EPA of industries the agency regulates, especially a recent directive that ushered industry-backed scientists onto influential scientific advisory panels.

“Scott Pruitt’s call for a ‘red team, blue team’ debate on climate change is a farce and a distraction,” according to Peter Frumhoff, director of science policy for the Union of Concerned Scientists. “If he has questions about climate science, he should turn to the U.S. National Academy of Sciences, not hacks from the Heartland Institute.”

Pruitt was questioned about his lavish expenditures, including the installation of a \$25,000 “secret phone booth.” Pruitt claimed, “It’s used for secure communication that needs to take place at the office.” Pruitt has made frequent visits to Oklahoma, his home state—43 times in 92 days in March, April and May—and expended nearly \$60,000 on private air travel since February. The agency’s Inspector General is investigating the expenses. It is possible that he is lining up deep-pocketed backers to run in 2020 for the Senate seat held by the Oklahoma Republican Senator James Inhofe, who is 83.

Rep Tony Cardenas (D-CA) said the “costs are especially offensive given the severe cuts” the administration has proposed to EPA, including eliminating the office of environmental justice. “Are the American people supposed to believe that we cannot afford \$2 million to help our most vulnerable communities, but we can afford tens of thousands of dollars for you to fly on private jets?” Pruitt assured the Committee that “environmental justice is an important issue.”

Rep. Kathy Castor (D-Fla.) repeatedly asked Pruitt if he would recuse himself from agency proceedings involving his allies in the energy industry. She noted that Pruitt, as Oklahoma attorney general, had sued the agency 14 times, and in eight of those cases, Murray Energy was a co-plaintiff.

“Given your extensive history of suing the agency you now oversee and the vast amounts of money you’ve raised from the fossil fuel industry, offering to recuse yourself from only active cases or only cases where Oklahoma is a party is grossly inadequate,” Castor said. “So will you commit to recusing yourself from cases involving your past co-litigants and donors?”

Pruitt said that his associations and lawsuits were deemed not to violate ethics rules by the agency’s ethics reviewer.

Earlier this week, the EPA’s Office of Inspector General said it would investigate a meeting Pruitt held in April with the National Mining Association about the Paris Agreement.

Castor also asked how many times Pruitt had met with representatives from energy companies, including Peabody Energy and the utility Southern Company. Pruitt responded that he didn’t know.

Readers of my Blogs know of the tremendous growth that has occurred over the past several years both in the U.S. and abroad regarding carbon-free energy, primarily solar and wind. In order for mitigation efforts to be successful in keeping global warming under 2 degrees C and meet the rapid time-frames necessary to move from fossil fuels to non-carbon fuel for energy production it is essential that such a switch not only be unrestrained but supported at the federal level. But that is not happening.

As details emerge as to what is contained in the largely unread tax bills that the Senate and House passed, some unpleasant facts have emerged. These bills could significantly hobble the U.S.’ renewable energy industry because of a series of provisions that scale back incentives for wind and solar power while bolstering older energy sources like oil and gas.

The possibility highlights the degree to which the nation’s recent surge in renewable electricity generation is still sustained by favorable tax treatment which has lowered the cost of solar and wind production while provoking the ire of fossil-fuel competitors seeking to weaken those tax preferences.

Whether lawmakers choose to protect or jettison various renewable tax breaks in the final bill being negotiated on Capitol Hill could have major ramifications for the U.S. energy landscape, including the prices consumers pay for electricity.

Wind and solar are two of the fastest-growing sources of power in the country, providing 7 percent of electricity in 2016. Sharp declines in the cost of wind turbines and photovoltaic panels, coupled with generous tax credits that can offset at least 30 percent of project costs, have made new wind and solar less expensive than existing fossil-fuel plants in parts of the country.

A Senate bill provision could cripple a key financing tool used by the renewable energy industry, particularly solar. The House bill would roll back tax credits for wind farms and electric vehicles, while increasing federal support for two nuclear reactors under construction in Georgia. The Senate legislation would open the Arctic National Wildlife Refuge in Alaska to oil drilling, while a last-minute amendment added by Senator John Cornyn (R-TX), would allow oil and gas companies to receive lower tax rates on their profits.

At a White House event to promote the Republican tax legislation a coal plant employee from North Dakota

thanked Trump for a provision in the House bill that would drastically reduce the value of the production tax credit for wind. He claimed that the production tax credit has destroyed the energy market, especially in the Midwest, claiming that wind production has eroded North Dakota's tax base and replaced coal production.

The wind industry has warned that the House language, which would reduce the wind tax credit to 1.5 cents per kilowatt-hour, from 2.4 cents, and change eligibility rules, could eliminate over half of the new wind farms planned in the US. Indeed, the wind industry is already seeing orders put on hold and projects are not able to get refinancing. Even the threat of this bill is having a chilling effect.

Trump has said he will impose tariffs on imported solar panels, which could increase the cost of solar power. The Senate bill could affect 39 gigawatts worth of planned solar projects around the country — nearly as much as all the US solar power that has been installed to date.

Such changes could slow what had been a steady pace of GHG mitigation and raise electricity prices for consumers in states like California, which have set mandatory targets for the share of renewables in their electricity mixes. In states without such targets, including Texas, more expensive new renewable plants could lose out to natural gas generation.

In addition to repealing renewable incentives, the House bill would also scrap a key tax credit for electric vehicles. Currently, the federal government offers a

tax credit worth up to \$7,500 for anyone who buys an electric car, though the credit quickly phases out for any manufacturer that sells 200,000 such vehicles in the U.S.

That would definitely be a big blow to the electric vehicle market, which is just picking up steam. While Tesla and General Motors are nearing their cap for the tax credit, repeal could significantly affect companies like Nissan, which was planning to introduce a new model of its all-electric Leaf in the coming year. Senator Dean Heller, Republican of Nevada, has said he will work to oppose the House's repeal of the credit. Tesla is building a major battery factory in his state.

Whether or not any of these provisions become law, it shows how clearly the Republican party is following Trump's lead in moving in precisely the wrong direction at least according to climate experts and leaders in the rest of the world.

In an effort to keep these Blogs from getting too long I'll end by briefly noting that wildfires continue to be in the news. The worst wildfires in California history include five fires covering more than a quarter of a million acres, with 9,000 firefighters combating the flames. More than 800 homes and structures have been destroyed (including Rupert Murdoch's \$30 million Bel-Air mansion, (he has called CC "alarmist nonsense")), 98,000 people have been forced to evacuate and 25,000 homes are threatened. Unusual drought conditions, unusually warm temperatures and high winds, all predicted by CC models and expected to worsen in future years, help explain the new normal.

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Some Good News for Renewable Energy Advocacy

By Carl R. Howard

Good news! In Blog 7, I reported that with regard to the tax bill both the House and Senate versions promoted fossil fuels and rolled back incentives supporting renewable energy. But the final bill continues some of the tax credits supporting further development of renewables, mostly wind, solar and electric vehicles. These last-minute reconciliation changes reflect the growing political clout of the wind and solar industries, which now provide more than 7 percent of US electricity and are two of the fastest-growing energy sources. But for now I will flag the fact that at least one issue remains that could negatively affect a key financing tool used for wind and solar projects. I'll keep you posted.

For years, Congress has offered tax credits for wind and solar projects that can offset 30 percent or more of the total costs. When combined with the falling costs of wind turbines and photovoltaic panels, these incentives can make new wind and solar cheaper than running existing fossil-fuel plants in parts of the country.

Several Republican senators, including Charles Grassley of Iowa and Dean Heller of Nevada, opposed rollbacks that would have affected their states. Wind turbines provide over one-third of Iowa's electricity. Grassley, a climate change skeptic, is a staunch defender of wind power. Tesla is building a major battery factory in Nevada and Heller has argued that the electric-vehicle credits are needed to support a fledgling industry.

Senator Rob Portman, R-Ohio, was on the conference committee to reconcile the House and Senate bills. Ohio has become a major manufacturer of wind turbine components, and the state has over 105,000 jobs relating to clean-energy.

The intense scrutiny toward the tax bill highlights how much the recent growth in renewable energy still depends, to some extent, on policy choices. Solar installations in the United States declined this fall due in part because of political uncertainty. Trump is contemplating new tariffs on solar imports that could raise the price of photovoltaic panels (as he continues to promote fossil fuels, see Blog 7).

The administration has made no secret of wanting to roll back tax preferences for solar and wind, arguing that those industries should have to compete on their own merit. As if the fossil fuel industry were not receiving billions of dollars each year in subsidies.

Congress does not plan on subsidizing renewable energy indefinitely. Under tax legislation passed in 2015, the credits for wind will phase out by 2020 and for solar by 2022.

The tax bill makes one other major change to energy policy by opening the Arctic National Wildlife Refuge in Alaska to oil drilling, a longtime goal of Senator Lisa Murkowski, R-Alaska.

Updating other Blog 7 mentions, the unprecedented CA wildfires burn on while Erie, PA received record-breaking snowfall (5' 5" over three days), Detroit reached its historic low temperature and the entire Northeast had near record low temperatures to close 2017. Overseas, the Philippines was hit by a major tropical storm killing over 100 people, stranding thousands and destroying dozens of homes and structures.

Recent Studies

In other good news, recent studies conclude that transitioning the world to 100 percent renewable electricity is entirely feasible based on existing technology and would be more cost-effective than the current system which relies primarily on fossil fuels and nuclear energy. The transition could be done by 2050 and it could reduce the per megawatt-hour cost to \$61 from \$82 (2015). The holdup now is purely political. The more cost falls, the more such technology will spread.

Solar power and battery storage are critical parts of the transition. In electric vehicles, where the size and weight of the batteries remain an issue, those factors are not critical when sited on land. The globe's electricity mix by 2050 could consist of solar photovoltaics (69 percent), wind energy (18 percent), hydropower (8 percent) and bioenergy (2 percent).

By following this path, greenhouse gas emissions in the electricity sector may decline to zero (that's the goal, anyway) and drastically reduce total losses in power generation. The renewable energy transition would create 36 million jobs by 2050, 17 million more than today. If we are to have a chance of meeting the essential Paris goal (limiting global warming to 1.5 degrees Celsius, 2.7 Fahrenheit) (recall from Blog 1 that we've already warmed 1.4 degrees F since the Industrial Revolution and that warming is occurring now faster than ever) then we must conclude that there is no reason to invest one more dollar in fossil or even nuclear power production. Renewable energy provides cost-effective power supply (without producing waste that will remain radioactive for thousands of years and require costly containment and protection from terrorists). All plans for further expansion of coal, nuclear, gas and oil have to cease. Investments need to be channeled to renewable energy and the necessary infrastructure for storage and grids. Everything else will lead to unnecessary costs and increasing global warming.

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Posted
12/28/17

Such a path would reduce global GHG emissions from about 11 Gigatons (11 billion tons) in 2015 to zero emissions (as close as possible) by 2050 or earlier. The world population is expected to grow from 7.3 to 9.7 billion and global electricity demand for the power sector may increase from 24,310 terawatt-hours (24,310 trillion watt hours) in 2015 to around 48,800 TWh by 2050. There is no way to meet the Paris goal if fossil fuel helps meet this demand.

But will such a major change by 2050 occur and if so is 2050 soon enough? Data is overwhelming in support of the proposition that climate change is happening faster than expected, and its effects more extreme than predicted. Because of the effective ‘Chicken Littling’ of Al Gore during the 2000 election, and due to aggressive attacks on CC scientists, predictions regarding CC have erred on the conservative side. But facts are facts when it comes to science.

In Blog 1 I urged you to read the IPCC Reports. In 2014 it formally declared that observed warming was “extremely likely” to be mostly caused by human activity. This year the U.S. Global Change Research Program stated: “There is no convincing alternative explanation.”

Many of the world’s leading scientific authorities have issued similar assessments. The Royal Society warned that we’ve been underestimating the risks of warming, not overestimating them. The American Meteorological Society issued its annual study of extreme weather events and said that such events would not have been possible without the influence of human-caused GHG gas emissions. The National Oceanic and Atmospheric Administration said recent melting of the Arctic was not moderating and was more intense than at any time in recorded history.

The Royal Society researchers warned that there hasn’t been nearly enough done to protect millions of vulnerable people worldwide from the expected increase in heat waves. This is a deadly tragedy in the making. Around 350 million people in places like Karachi, Kolkata, Lagos and Shanghai are likely to face deadly heat waves every year by 2050—even if nations are able to rein in GHG emissions enough to reach the Paris goal. There is no reason to believe we will meet that target.

Globally, building resilience has been far too slow and inadequate. As a result, the cost of dangerous and damaging storms is counted in thousands of deaths annually and hundreds of billions of dollars in lost homes, infrastructure and livelihoods.

Another potentially horrific occurrence I mentioned earlier is the increasing chance that global warming will affect a key North Atlantic current that carries ocean heat from the tropics toward western Europe. The Atlantic Meridional Overturning Current may weaken by 37 percent by 2100, which could alter European climate and

food production. Other oceanic and air currents likely will affect the climate worldwide and early indications are that this is happening.

Recent reports strengthen predictions made earlier as well: increasing risk that ocean acidification will rapidly and significantly alter many ecosystems and food webs; crops grown in high-CO2 conditions could be less nutritious, leading to mineral deficiencies; commonly accepted wet-areas-wetter and dry-areas-drier scenario has regional nuances with important implications for local water management and food production and planning; and scientists are finding more links between melting Arctic sea ice and weather extremes like the heat waves, droughts and blizzards we have been experiencing.

The U.S. Global Change Research Program reported that changes in ocean ecosystems go far beyond rising sea levels. Ocean acidification is increasing, as is oxygen loss, raising the risk of serious ecological and economic consequences. I trust you are all keeping in mind the pyramid I discussed in Blog 1 and how all of the above is rapidly cutting out the four blocks supporting Homo Sapiens and human civilization.

Penn State climate scientist Michael Mann (read his book *The Madhouse Effect*) said, “We are seeing increases in extreme weather events that go well beyond what has been predicted or projected in the past. We’re learning that there are factors we were not previously aware of that may be magnifying the impacts of human-caused climate change.” Among those are “subtle mechanisms involving the behavior of the jet stream that may be involved in explaining the dramatic increase we’ve seen in floods, droughts, heat waves and wildfires.” “Increasingly, the science suggests that many of the impacts are occurring earlier and with greater amplitude than was predicted.”

“We have literally, in the space of a year, doubled our assessment of the potential sea level rise we could see by the end of this century. That is simply remarkable. And it is sobering,” he said.

In general, there should be more monitoring of global warming impacts, but all those programs are threatened under the current administration, Mann said. “Continued funding to support research is critical,” “and here, again, we encounter a very unfavorable political environment where fossil fuel-beholden politicians that run the White House and Congress are doing everything they can to defund and suppress research on climate change science and impact assessments.”

Year-End Thoughts

As 2017 ends the macro-conditions globally are as I’ve described them above, and in prior Blogs. The challenges are immense. Despite the clear science and the clear and present danger of climate change, mankind continues to emit GHG into the atmosphere which

undermines the four essential blocks upon which we all depend. We have the information we need to motivate us to change, we have the physical, financial and technological capability to make the kinds of changes that might avert more of the horrors we have experienced and the catastrophe we are told will come. To fail to take effective action would be the very definition of tragedy, and stupidity. American leadership is important but lacking at the federal level. Prior Blogs have described much of the great work being done in the U.S. and abroad by individuals, corporations, universities, mayoral groups, Republican caucuses, and others. It is now up to each one of us to make new year resolutions to do what we can do to ensure that we each do our part. Each of us has a carbon footprint and living the way we all do, our footprint is significant. Beyond that, we each can

contribute in many ways to organizations and individuals who work on our behalf to bring about the kinds of changes that are necessary.

This need not be a partisan issue. It shouldn't be. It is essential that we contribute to elections on the local, regional, state and national levels to ensure that elected officials understand the issues and are committed to addressing them as they relate to climate change. Consider contributing to candidates running in the mid-term elections in other states that are important to this effort. If we do not adequately address these issues, little else will matter. The kinds of disruptions and harm from the impacts of CC have the potential to thoroughly disrupt our way of life, our well-being, and certainly that of our children.

Heavy, Dangerous Storms Will Continue to Be a Threat

By Carl R. Howard

It will never stop. This is McKibben's "Eaarth" (see Blog 3). A new planet, unpredictable except that the weather will be harsh and dangerous somewhere, all the time. I wrote about the California drought, and wildfires (Blog 7). Certain things logically follow, like fire after drought. But less clear to most of us is that mudslides would logically follow as the weakened soil gave way in heavy rains. We're talking big ticket items here. But scientists are out there measuring how plants, animals, birds, grasses, mosses and microscopic organisms, the base of the food chain, cope, or don't. We know that the microscopic organisms that support the vital food chain in the Arctic has changed. We know major changes will likely result. We know that beavers have expanded their range north into the Arctic too and that the flooding they cause, usually beneficial to the environment, is destructive in the Arctic. Flooding there keeps the soil from freezing which means more methane is being released from the un-frozen tundra. I wrote about this dangerous 'positive' feedback loop in Blog 2.

Global warming is adding more moisture to the atmosphere which is why the skiing in Europe is outrageous right now. Six feet of snow fell on Davos in six days as heads of state try to fly there for economic meetings. And a powerful wind storm killed at least seven people in three countries in northern Europe (Netherlands, Belgium and Germany). Heavy winds (87 mph in Holland) grounded hundreds of flights, closed roads and the port of Ghent (Belgium), halted trains, ripped roofs off buildings and flipped over trucks and other vehicles. Hundreds of thousands were left without power, including in Germany and Romania. In the UK, Storm Caroline dumped 11 inches of snow in Central England and 18 inches in Wales. Northern Ireland was also slammed.

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Posted
1/25/18

Such heavy and dangerous storms likely will be a regular topic on this Blog as they are predicted to be the new normal on this new Eaarth. Drastic weather changes cause trouble. Three documented immense and unusual avalanches are attributed to climate change. The first, in the Caucasus in 2002, traveled eight miles reaching speeds of 179 mph causing 120 fatalities in a sparsely populated area of Southwest Russia. The second, in Tibet in 2016, moved 247 million cubic feet of snow and ice killing nine people and hundreds of animals covering more than five miles in three minutes at speeds of up to 186 miles per hour. That is enough snow and ice to fill one million freight train cars stretching 7,500 miles. A third avalanche in Tibet occurred nearby.

Climate change is being blamed for these unprecedented events. As noted, the warming air holds more moisture, the area has warmed .4 Celcius per decade since the 1960s, so more snow falls in winter. But in the summer, the region has experienced heavier rainfall. The rain creates crevices in the glacier and saturates the ground, which lubricates the natural flow of the glacier due to gravitational pull downslope. These increasingly topheavy, undermined, glaciers are now more prone to collapse which triggers the avalanche.

These three avalanches were in sparsely populated areas. There are many glaciers around the world perched above cities...

Mountain Gorillas/Climate Stability

As pictured above (for Mailchimp recipients of this Blog), I'm just back from Rwanda where I sat with Silverbacked mountain gorillas and watched them eat the surrounding vegetation. The guides said that weather patterns, rainfall and rising temperatures, have changed. As with the rest of the world, past dry and rainy

seasons are less reliable. The timing is off. Rain can be destructively heavy, or absent. The result is a change in the vegetation upon which the gorillas depend. Certain nutritious plants are no longer found where they once were. Sudden changes like this are inconsistent with evolutionary patterns of slow, gradual change and adaptation. It remains to be seen whether the world's mega-fauna, gorillas, polar bears, whales, can adapt to life on Earth.

Eco-tourism to Africa is now a prime income-generating industry. Climate change is a direct threat to the future viability of this multi-billion dollar industry. Should it collapse, the economic and political fallout could be severe, and dangerous. The gorilla tourism industry was totally shut down in the 1980s when political violence convulsed Rwanda. Rwanda and Uganda now enjoy a robust eco-tourism industry. Congo (the third country from which one can trek to see these gorillas) lags behind but may join its neighboring

At the Paris meeting in 2016, the temperature was at 1.1 C above the pre-industrial average and global emissions had nearly reached 50 bt/yr. There is scientific agreement about how dangerous a path the planet is on in terms of continued human civilization and the survival of its mega-fauna, and yet even nations committed to fighting climate change are making little headway.

In law school, most of us learned of the Tragedy of the Commons. The seemingly rational behavior and thinking where one person chooses to dispose of his waste in the public commons since it costs him nothing except that it degrades the community commons. And so the next and the next person did the same until the commons was so despoiled as to be worthless to them all. The atmosphere is our collective commons and we are despoiling it just as fast as we possibly can with full knowledge of our stupidity and self-destructiveness. It's really quite remarkable.

"As predicted, 2017 was one of the warmest years on record, slightly behind 2016 and 2015. And it was every bit as destructive as drought, wildfires, mudslides, famine, reduced crop yield and political instability caused immense suffering and loss of life here in the US and elsewhere globally."

countries in this lucrative business, which is the only reason these gorillas still survive.

Rain, and potable water, are crucial issues globally in terms of political stability. In many countries in Africa and the Middle East, water shortages have led to environmental refugees, political instability and the rise of ideologies embraced by groups considered terrorists in the west. The changing global climate relating to rainfall and warming temperatures, which dry the soil, reduce crop yield and evaporate surface water, is all based on rising CO₂e levels (carbon dioxide equivalent).

The international community has been trying for 30 years to curtail CO₂e emissions without success. At the first meeting of world leaders in 1988 in Toronto, the earth's average temperature was just over half a degree Celsius above the pre-industrial average and global CO₂e emissions were about 30 billion tons/year (not including deforestation and land use, two important factors in CO₂e emissions and absorption). World leaders called for emissions to be cut by one-fifth.

Instead, by the 1997 meeting in Kyoto, Japan, emissions had increased to 35 bt/yr and the earth's temperature rose to about .7 C above the pre-industrial average.

No one country is willing to step up in a way that will harm it economically in competition with other nations. Some countries are making huge investments in alternative energy (China with solar and electric vehicles, Norway and other countries have committed to phasing out gas-powered vehicles and going 100 percent electric by 2050) but some countries may be willing to gamble that the efforts made by others will suffice for all countries.

But that's not going to happen. Even if every country were to fulfill the commitments it made in the Paris accord (including the U.S.), it still would not satisfy the Paris accord goal of keeping global temperature under 2 C rise above the pre-industrial average (of which we have about .9 C rise left to go and we almost certainly have enough CO₂e already emitted to cover this last little rise. Not to mention the contributions from the various "positive" feedback loops noted and referenced above. In fact, if all these commitments were met, by 2030 global CO₂e emissions would still exceed the level needed to remain under 2 C by 12 -14 billion tons.

And so the warming and the changing weather patterns persist. As predicted, 2017 was one of the warmest years on record, slightly behind 2016 and 2015. And it was every bit as destructive as drought, wildfires, mudslides, famine, reduced crop yield and political instability caused immense suffering and loss of life here in the U.S. and elsewhere globally.

Meetings of the heads of state of 196 nations are a wonderful thing. The world is acutely aware of the danger. The IPCC and many other reports are widely known and accepted. And still CO₂e emissions continue to rise. It is virtually certain that island nations such as the Maldives will be submerged and abandoned. This is as unfair as it is cruel. They contributed nothing to CO₂e emissions. And yet the world hardly notes this tragedy.

As the destruction and dangers repeatedly hit home in the first world, as environmental refugees continue to wash ashore desperate, starving and begging for entry, the first world will have to take more notice than it is doing now. Californians are taking notice. Floridians and Puerto Ricans and residents of Houston are taking notice. Any of the storms that devastated our southern fellow Americans could easily have come up the eastern sea-board and swamped New York City. As you read this, you could easily have been displaced, your home, your office, the infrastructure you depend on, could all be in disrepair right now. Many of those harmed by Sandy still have not recovered. We are not far from a cycle of overlapping storms and recovery. And that is no way to live. Just ask the Floridians, Puerto Ricans and Houstonians, and Sandy survivors.

We are not yet having serious discussions about building billion dollar protections for New York City, but we will be. And when we do, if such discussions follow major devastation from a storm, the discussions will be accompanied by mass departures, such as after 9/11, lawsuits, and devaluation of real estate. But how many of us have been involved in such discussions? Not many, I'm sure. We will be.

If we are to have a chance of meeting the Paris goal of staying under the 2 C limit, we not only must abandon use of fossil fuels, we will need to develop technology that can remove CO₂e from the atmosphere. Something more than planting trees. There is little on the drawing board at present.

To escape from the largely unproductive pattern we've been following for 30 years, some are thinking more creatively. An individual country may have political difficulty imposing what many believe to be a necessary carbon tax, but perhaps countries acting in concert could do so. Or countries banding together could impose tariffs on imports from non-members who were not similarly committed to reducing their emissions. Or perhaps the target could be more narrowly and strategically set such as the 2016 agreement between 170 nations meeting in Kigali, Rwanda, to reduce hydrofluorocarbon emissions. Or maybe specific industries, like aviation or steel, band together and adopt industry-wide standards on a global basis. There are lots of ideas out there, but not enough action.

A growing concern is that at some point, perhaps after terrible suffering, death, disruption and conflict,

desperation steps will be taken either following international debate or unilaterally. Many countries could move toward geoengineering on a global scale, such as injecting aerosols into the atmosphere to reflect the sun's heat back into space, or deploying jets to spray sulfur dioxide into the upper atmosphere, which would temporarily cool the planet. But such drastic actions would have foreseeable and unforeseeable consequences, especially for mega-fauna, which would be unlikely to survive if it comes to that.

From what I've read, and reported in my Blogs, we have all the know-how and technology we need. Many trends are going in the right direction, the falling price of wind turbines, solar panels and batteries, the enormous investments in alternative energy, the commitment of many countries to move exclusively to electric vehicles. The primary cause of the lack of sufficient movement is economic competition, the profit motive, politics and the desire for (political) power. The good news is that 196 countries are talking about the issues. The bad news is that things will have to get worse before there is sufficient motivation to get over these obstacles.

Water/Political Stability

Staying with a focus on water for this Blog, and how insufficient amounts contribute to civil unrest, political instability, environmental refugees, conflict and war, look at Nigeria, Syria, Somalia, India and Iran. The World Resources Institute warned recently that water stress in 33 countries is projected to be extremely high by 2040.

Water shortages, like price increases for bread, have sparked street protests and unrest. Water stress in India has caused civil strife and has been exploited by terrorist groups such as the Shabab in Somalia. Lack of water pushes people off ancestral lands and into over-crowded cities. Boko Haram has taken advantage of the unrest in Nigeria, Chad and Niger.

Iran too is experiencing severe water stress and civil unrest. Land that has supported human habitation for thousands of years is now barren, arid. Lakes that supported towns and villages and agriculture are gone, nothing left but a dust bowl. Lake Urmia, in northwestern Iran, is nearly 90 percent gone. Millions of people have moved toward towns and cities where there are no jobs for them. Just militant gangs preaching death to those deemed responsible, especially "the West." Iran has experienced 14 years of horrendous drought. With no end in sight. In fact, it will only get hotter, drier. Worse.

Last summer I was on Lake Titicaca in Bolivia. As much fun as that is to say and write, another lake in Bolivia, Poopo, is dry. Gone. And with it the villages and agriculture dependent upon it.

Policy played a role in Iran's water shortage. In an effort to be more self-sufficient in food, the government encouraged farmers to plant thirsty crops like wheat

throughout the country. The government compounded the problem by offering farmers cheap electricity and favorable prices for their wheat, a two-part subsidy that led to additional planting of wheat and the extraction of more groundwater. Currently, 25 percent of the water drawn from aquifers, rivers and lakes exceeds the amount that can be replenished naturally. Syrian policy, too, promoted planting of wheat with similar results.

Iran's groundwater depletion rate is today among the fastest in the world. Twelve of the country's 31 provinces likely will exhaust their aquifers within the next 50 years. The internal conflicts over scarce water resources will be intense. External impacts from hundreds of thousands, eventually millions of refugees will add to the millions of refugees fleeing similarly parched countries. It is happening now. It can only get worse.

Iran is predicted to experience a 25 percent decline in surface water runoff—rainfall and snow melt—by 2030. In the region as a whole, summers are predicted to get hotter by 2 -3 degrees C. Rains are projected to decline by 10 percent. Recent studies predict that many major cities in the region could exceed a tipping point for human survival in the not too distant future.

Syria experienced a drought from 2006 to 2009, prompting a mass migration from country to city, leading to mass unemployment among the young. By 2011 street protests were frequent and violent, and violently suppressed by the government of Bashar al-Assad. Civil war erupted. Water did not cause the unrest, but it contributed to it.

Global warming not only evaporates surface water faster, it alters the chemistry of surface water bodies. The Sorpe reservoir in northwest Germany, one of four freshwater reservoirs observed in a recent study, found that carbon dioxide is absorbed in lakes, rivers and streams which can affect entire ecosystems. Scientists are just beginning to investigate this, as they are investigating the impacts of carbon absorption by oceans, but the initial findings are frightening.

Oceanographers began monitoring carbon levels in seawater in the 1980s. Over the past three decades they've chronicled a steady rise of carbon dioxide in seawater. The increasing concentration can harm marine life in many ways. We know that it lowers the pH of seawater, making it more acidic and interfering with the chemistry that coral use to build their calcium skeletons. Ocean acidification also thins the shells of oysters and other animals. Less well known is that many marine organisms rely on chemical changes in water to find food and avoid danger. The rapid change in the chemistry of seawater has rendered certain fish unable to detect their predators. Now scientists are finding similar adverse effects in freshwater bodies.

For starters, carbon levels in four reservoirs in Germany tripled from 1981 to 2015. Sure enough, studies showed that organisms comprising the foundation of the freshwater food chain in these reservoirs (water fleas) were being adversely affected by the changed chemistry of their environment with likely adverse impacts on the entire lake ecosystem. The increased amount of carbon in the water was harming their nervous system and their ability to avoid predators. Other studies showed similar results for other foundation fish (minnows). And other studies showed that different types of mussels, which perform essential filtering services, were also impacted by raised carbon levels.

As I have been advocating from Blog 1, if we adversely affect the foundation layer of the food pyramid, we threaten all life dependent on this base layer, including homo sapiens precariously balanced on top.

But much more study is necessary. A study of a lake in Wisconsin found that between 1986 and 2011, there was no significant carbon level change. Different lakes will respond differently depending on many factors such as the amount of vegetation in the lake which may absorb the carbon. Whether or not we are reaching an absorption saturation point for such vegetation remains to be seen. But initial findings are suggesting at least some water bodies may be experiencing stress and rapid change. And in the "old earth" accustomed to slow, gradual evolutionary change, rapid change produces many more losers than winners.

There is no good reason to risk undermining yet another foundation for life on earth. Glacial collapse, shrinking glaciers too, threaten people living nearby and those dependent upon the melt-water run-off for drinking water and agriculture. Warming temperature, warming seas, changing chemistry of fresh and salt-water bodies also threatens ocean and land-based food resources. Political unrest leads to political instability. All of the foundational blocks upon which human civilization depends are being undermined. The political process to deal with these threats is not working. The move away from fossil fuels is painfully, dangerously, slow.

Washington

Trump recently imposed steep tariffs on imports of, among other things, solar energy cells and panels. Two solar companies, Suniva Inc. and SolarWorld Americas, said imports of cheap solar cells and modules were putting their companies at risk.

While the tariffs were welcomed by the companies that sought them, economists warned the levies could drive up prices for consumers and hurt some American businesses. The solar industry has been split over the tariffs; companies that develop large-scale solar farms, as well as purchasers of solar power such as retailers and tech companies, opposed the tariffs over concerns that they would cost them more money and make solar power

less competitive with other energy sources, at least in the short term.

Abigail Ross Hopper, the president of the Solar Energy Industries Association, which opposed the measures, said the decision “will create a crisis in a part of our economy that has been thriving, which will ultimately cost tens of thousands of hard-working, blue-collar Americans their jobs.”

Trump imposed tariffs ranging from 15 percent to 50 percent on various imports. He approved solar tariffs for the next four years, starting with levies of 30 percent that will ultimately fall to 15 percent. In each of the four years, the first 2.5 gigawatts of imported solar cells will be exempted from the tariff, an exception designed to ensure that existing solar module manufacturers in the U.S. can still access cheap supplies of cells.

The administration said that the tariffs are largely directed at China, which over the past decade has

built itself into the world’s largest manufacturer of solar products, flooding global markets with low-cost crystalline silicon panels. While the U.S. has previously imposed restrictions on Chinese solar products, Chinese firms simply moved production to other countries. A China representative stated that China will defend its interests. Currently, more than 95 percent of America’s solar panels are imported, with half of those imports coming from Malaysia and South Korea.

While cheap global production has undercut American solar manufacturers, it has benefited purchasers of solar power. The average cost of solar installations in the U.S. has fallen 70 percent since 2010, from \$7.50 per watt to around \$1 per watt. The tariffs may cause more manufacturers to move to the U.S. but it likely will cause these products to be more expensive, a disadvantage in a highly competitive market. Trump has made clear that he favors fossil fuels over solar power.

News from Washington

By Carl R. Howard

Washington

I’m leading, and ending, this Blog with news from Washington. A notable alarm was sounded in the Worldwide Threat Assessment from the U.S. Intelligence Community. The document, issued by Daniel R. Coats, the director of national intelligence, addressed climate change and other environmental problems, stating that the impacts of the long-term trends toward a warming climate, more air pollution, biodiversity loss, and water scarcity are likely to fuel economic and social discontent and upheaval.

We are seeing much of this already. As described below, Cape Town, the second-largest city in South Africa, is so low on water after an extended drought that it may be forced to shut off the taps in July. Water scarcity is a factor in the violent conflicts in Syria and Yemen, and in both countries, control of water supplies is being used as a weapon of war.

The past 115 years have been the warmest period in the history of modern civilization, and the past few years have been the warmest years on record. Extreme weather events in a warmer world have the potential for greater impacts and can compound with other drivers to raise the risk of, among other things, humanitarian disasters, refugees, conflict, water and food shortages, population migration, labor shortfalls, price shocks, rioting, and power outages. Research has not identified indicators of tipping points in climate-linked Earth systems, but the

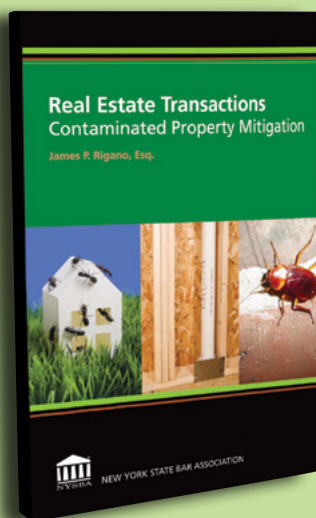
possibility of abrupt climate change is real, leading to additional social unrest and upheaval.

The scientific consensus is that over the next few decades, at least, the likely prospect is a gradual worsening of the kinds of climate-related problems the world is currently experiencing. But beyond a few decades, the possibility of catastrophes like the assured melting of polar sea ice could potentially cause profound climatic disruption and thereby wholesale disruption to human civilization.

Worsening air pollution from forest burning, agricultural waste incineration, urbanization, and rapid industrialization, with increasing public awareness, likely will continue to drive protests against authorities, such as those recently in China, India, and Iran. Indeed, such protests likely have pushed China to commit to large-scale investments in solar power and electric vehicles.

The Assessment does not explicitly mention the burning of fossil fuels, but that is a main cause of the poor air quality the plagues many cities in the developing world, and has even caused deteriorating air quality in places like London. Burning coal and oil not only causes climate change, it emits particles into the air that cause asthma, heart attacks and other health problems. The World Health Organization estimates that three million people die prematurely every year because of outdoor air pollution, and over four million more because of indoor exposure to dirty fuels used for heating and cooking.

Continued on page 53



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James P. Rigano, Esq., brings a wealth of experience to this publication—his legal practice having focused exclusively on environmental law issues over the last two decades. Having worked at both the state and federal levels, the author has dealt with environmental issues surrounding brownfield development projects, hydroelectric facilities, and major transmission lines, and has handled litigation involving open space wetlands, and air pollution issues.

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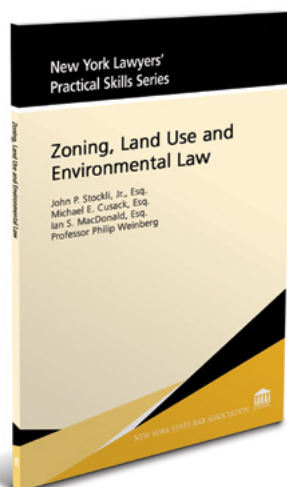
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News from Washington

Continued from page 48

The Assessment notes that accelerating biodiversity and species loss, driven by pollution, warming, unsustainable fishing, and acidifying oceans, will jeopardize vital ecosystems that support human health and a functional environment. Recent estimates suggest that the current extinction rate is 100 to 1,000 times the natural extinction rate.

The document implies that the rate of extinction has accelerated due to human activities. Some scientists fear that we have entered the sixth mass extinction of organisms in Earth's history.

Water scarcity, compounded by gaps in cooperative management agreements for nearly half of the world's international river basins, and new unilateral dam development are likely to heighten tension between countries. Water evaporates more rapidly in a warmer world, and many areas of the world currently receive less water than previously due to changes in climatic conditions. Such conditions are predicted to worsen in terms of adequate water supply.

With regard to global climate disruption, scientists have ruled out any natural explanation, concluding that the human release of greenhouse gases explains the warming that has occurred since the 19th century. The emissions from burning fossil fuels and the chopping down of forests precisely correlates with the increase in atmospheric carbon levels and global warming and climate disruption. The Assessment is yet another in a long string of wake-up calls that could not be more clear. That it was issued by the director of national intelligence should give it added weight. Climate change is a clear and present danger to our security.

Fire and Rain

Eleven point eight (\$11.8) billion dollars. That is the record-breaking amount of insurance claims filed so far in the recent wildfires in California alone. Those fires followed years of drought which made conditions so ripe for fire. In the aftermath of the fires, torrential rains caused historic mudslides. And now CA is enduring an unusually warm winter which means its snowpack in the Sierra Nevada, the source of about one-third of California's water, at 21% of normal in mid-February is a threat to its agricultural (irrigation) and drinking water needs.

Elsewhere, Paris has experienced record flooding while South Africa is suffering from record drought. Cape Town's water supply may soon run out and be shut off entirely ("Day Zero" forecast for this July) for residential and business uses. The government cautioned that the Day Zero threat will surpass anything a major city has faced since World War II or the Sept. 11 attacks.

Talks are underway with South Africa's police because normal policing will be entirely inadequate for the chaos that will ensue should the taps run dry. Imagine four million residents lining up for water rations at 200 collection points (that's lines of 20,000 people per point). The army will be called in to try to keep order.

The area has been through a three-year drought, the worst in over a century. Cape Town may become one of the few major cities in the world to lose piped water to homes and most businesses.

Such dire conditions have long been predicted by climate change models. Long, persistent droughts likely will continue throughout much of Africa. Cape Town's problems are a potent warning to other governments, few of which have this city's resources and have done little to adapt.

In 2014, dams were full after years of good rain. The following year, C40, a collection of cities focused on climate change worldwide, awarded Cape Town its "adaptation implementation" prize for its management of water. The city's reservoirs currently are at just 24 percent of capacity, and falling. We all would be wise to heed the predictions of the world's leading climatologists and conserve, adapt and mitigate, rapidly.

Cities elsewhere have faced serious water shortages. Millions of Brazilians have endured rationing because of prolonged droughts. Brasília, the capital, declared a state of emergency a year ago. Experts say the water shortages in Brazil, which have affected more than 800 municipalities across the country, stem from climate change, the rapid expansion of agriculture, bad infrastructure and poor planning.

Last year, Cape Town limited residents to using 87 liters of water, about 23 gallons, per person, per day, for all uses including bathing, drinking, cooking, cleaning and toilet flushing. On Feb. 1, it lowered that limit to 50 liters, and it is fining violators.

Though consumption is down sharply, most residents have not met the 50-liter restriction, a point of tension in a city that encompasses both luxurious homes with pools and gardens, and shanty towns with communal taps.

The provincial premier urged people to shower no more than twice a week, calling oily hair a badge of honor, and suggested reusing "gray water" from cleaning to flush toilets.

For anyone accustomed to plenty, the picture is grim: Taking a two-minute shower, flushing a toilet once, washing a load of dishes, and doing ordinary drinking, cooking, cleaning and tooth-brushing is enough to reach the limit.

Cutting back is a difficult message to convey in one of the world's most unequal societies, where access to water reflects Cape Town's deep divisions. In squatter camps, people share communal taps and carry water in buckets to their shacks. In other parts of the city, millionaires live in mansions with glistening pools.

In poor areas, residents without cars wonder how they will carry water containers home from a collection point. In wealthy areas, some residents are installing water tanks in their yards and attempting to tap into deep, largely depleted underground aquifers.

"Beyond the emergency, this flooding phenomenon, which is more and more recurrent in Paris, reminds us how important it is for our city to adapt to climate change," she said in a tweet.

Paris has experienced major floods in the past. In 1910, the Seine rose above 28 feet. The expectation is that now the flooding will occur more frequently, and it may be more severe, damaging, dangerous and disruptive.

Although local officials said they were now prepared to face similar conditions, experts from the Organization for Economic Cooperation and Development estimated

"Last year, Cape Town limited residents to using 87 liters of water, about 23 gallons, per person, per day, for all uses including bathing, drinking, cooking, cleaning and toilet flushing. On Feb. 1, it lowered that limit to 50 liters, and it is fining violators."

In France the question is whether they must simply get used to flooding. Recently the Seine River overflowed its banks in Paris and several nearby cities, less than two years after reaching its highest level since 1982. Thirteen of France's 96 administrative departments had flood alerts in January 2018, in what the monitoring body Météo-France says was the country's wettest winter since 1959.

Some experts suggest climate change is likely to make such events more frequent. And an international body chose this week to publish a study arguing that Paris and the rest of the Seine basin needed greater protection against the risk of a catastrophic flood.

In the January flooding, 400 people were evacuated from homes in the Paris region, and a thousand faced power cuts. Rivers have swelled across the country, forcing evacuations and the closing of roads and infrastructure. The Seine rose 18 feet above normal (and was expected to rise to 19.6 feet), river traffic was interrupted and roads and train lines along the river banks were closed. In the floods of June 2016, which killed four people in France, it peaked at 20 feet.

"Because of climate change, we can expect floods in the Seine basin to be at least as frequent as they are right now," said Florence Habets, a senior researcher at the C.N.R.S., France's national center for scientific research. "No matter what we say, the more we reduce our greenhouse gas emissions, the more we reduce our impact on droughts and floods."

The mayor of Paris, Anne Hidalgo, a left-wing politician who has been at the forefront of the fight against climate change, was also quick to mention long-term challenges.

that such a catastrophe could affect five million people and cost up to 30 billion euros, or about \$37 billion.

In a recent study, they noted that although Paris had implemented further flood prevention policies since 2014, the authorities' efforts remained limited compared to the risks the city faced.

One of the most affected areas was the town of Villeneuve-St.-Georges, 10 miles south of Paris, where the military had to help residents evacuate their homes and propel themselves on dinghies through streets flooded with brownish water and waste.

"For some people, this is the second time in 18 months that they have been victims of floods," Alexandre Boyer, a local councilman, said. "It's beginning to get a little too much."

Solar

Saudi Arabia, the world's largest exporter of oil, is moving in a new direction. The Saudi government wants not just to reshape its energy mix at home but also to emerge as a global force in clean power. Riyadh hired ACWA Power, a Saudi energy company, to build a solar farm that would generate enough electricity to power up to 200,000 homes. The project will cost \$300 million and create hundreds of jobs. By the end of 2018, Saudi Arabia aims to invest up to \$7 billion to develop seven new solar plants and a big wind farm. The country hopes that renewables, which now represent a negligible amount of the energy it uses, will be able to provide as much as 10% of its power generation by the end of 2023.

Saudi Arabia has talked a big game when it comes to renewables. It adopted ambitious targets for green power several years ago, but no major projects were carried out,

and little changed. But the Saudis have experimented with solar power projects and appear ready to make a major move. They have focused on conventional solar panels over another system, concentrated solar, in which mirrors focus sunlight to create heat.

Saudi Arabia, with its vast oil resources, would seem an unlikely champion for renewables. But the country's location and climate mean it has plenty of promising sites for solar and wind farms.

The costs of installing and operating those two technologies have fallen drastically around the world in recent years. That means that even in a country where oil is plentiful, renewables beckon as a cheap, and clean, alternative to traditional fossil fuels.

For the proposed project, Riyadh received bids for the solar farm, which will be built in Sakaka, in northern Saudi Arabia, that rivaled the lowest ever submitted at auctions anywhere. At 2 to 3 cents per kilowatt-hour, a wholesale measure of electricity, solar power here would be below the cost of fossil fuel-generated electricity. A big push into wind and solar power would also have other benefits, notably allowing Saudi Arabia to sell more of its oil.

Saudis rely on air-conditioners for much of the year, and the scorching Arabian summer sends demand for power soaring. Much of that electricity today is generated at power plants fueled by oil. Last June, the facilities burned an average of 680,000 barrels of oil a day.

That figure—comparable to the output of a modest-size oil-producing country like Egypt—was down from nearly 900,000 barrels a day in 2015, but it still essentially represents wasted cash. Had it been sold overseas, that crude could have added \$47 million a day to government revenue, at current prices.

Selling oil internationally is central to funding the Saudi budget. The terms of the Sakaka project's auction required that developers pay the upfront cost of the solar farm, in return for payments for the power they supply to the grid. That would allow Saudi Arabia to continue focusing on producing and exporting oil while it makes the shift to cleaner power.

A major plank of the crown prince's plan to transform the Saudi economy involves finding jobs for young people. Attracting investment into what is essentially a nonexistent sector in the kingdom means creating jobs, creating manufacturing.

The Saudi market's sheer size, however, means it merits the attention of the world's renewable energy companies. Paddy Padmanathan, the chief executive of ACWA Power, which also has other energy projects in the region, predicted in an interview last month that once the country's energy authorities became comfortable with

renewables, they would ramp up their goals for wind and solar power production.

Washington

As reported in Blog 5, Trump had nominated of Kathleen Hartnett White, a climate change skeptic, to lead the Council on Environmental Quality. She stumbled in her hearing before the Senate Environment and Public Works Committee. Still, she was approved by the Committee on a party-line vote, but her nomination languished in the full Senate at the end of 2017.

President Trump in October appointed Ms. White, a former Texas environmental regulator who has said that carbon dioxide should be considered the "gas of life" rather than a pollutant, to be the White House senior environmental adviser.

When asked if she believes climate change is real, she said "I am uncertain." She then corrected herself saying it was real but questioned the extent to which humans cause climate change. She was asked to estimate how much heat in Earth's atmosphere is stored in the oceans. She replied that she didn't have numbers like that and that there wasn't one right answer.

The most up-to-date scientific assessment on climate change, released by the Trump administration in November, found that the world's oceans have absorbed "about 93 percent of the excess heat caused by greenhouse gas warming since the mid-20th century, making them warmer and altering global and regional climate feedbacks." The bigger question is how much more heat can the oceans absorb, if any, and what is the damage being done to this critical resource?

Democrats also assailed Ms. White's writings in which she called renewable energy "unreliable and parasitic," described global warming as "a creed, a faith, a dogma that has little to do with science," and asserted that science does not dictate policy in democracies.

President Trump resubmitted Ms. White's nomination to the Senate but does not appear to have the votes to have her approved.

On the rules rollback front, methane is again being targeted. Methane is a greenhouse gas 20 times as potent as CO₂ in the atmosphere. The Obama administration, as part of its larger strategy to combat climate change, approved two rules to minimize emissions of methane. This included EPA regulating emissions from new oil and gas wells and the Interior Department requiring oil and gas companies to control venting and flaring from existing wells on public lands. Pruitt's EPA has attempted to delay both rules, but such efforts have been thwarted by the courts. Now, two riders attached to appropriations bills (both approved in House floor votes) would kill both rules, at great cost to the climate and to clean air and without any public notice or comment.

The Budget, Facts on the Ground, Good News, Not Such Good News, and Washington

By Carl R. Howard

The Budget

Environmentalists are mostly pleased and relieved at the budget Trump reluctantly signed. Trump proposed a 31 percent cut to EPA's budget but Congress maintained the Agency's former level of funding. Trump proposed 70 percent cuts to energy-efficiency and renewable-energy programs but funding for these programs increased. Trump proposed a mere \$64 million for the Land and Water Conservation Fund, which protects threatened open space, but it was funded at \$425 million.

Republicans proposed numerous environmentally destructive riders but they were deleted from the final budget. These riders included attempts to delay enforcement of clean-air regulations, kill two Obama-era rules intended to reduce greenhouse gases from oil and gas wells, weaken protections for endangered species and insulate the Trump administration from legal challenges to its efforts to repeal clean-water rules.

Democratic Senators Charles Schumer (NY), Patrick Leahy (VT), Tom Udall (NM) and Thomas Carper (DE) were instrumental in defeating these riders. Also defeated were attempts by Lisa Murkowski (R-AK), chairwoman of the Senate Energy and Natural Resources Committee, to kill protection of old growth forests in Alaska, and Thad Cochran (R-MS), who favored a flood-control project known as the Yazoo Pumps which would have drained 200,000 acres of wetlands in the Mississippi Delta in favor of soybean farmers.

Trump failed to defund the federal government's Advanced Research Projects Agency-Energy. Created a decade ago, ARPA-E now spends \$300 million a year nurturing untested technologies that have the potential—however remote—of solving some of the world's biggest energy problems, including climate change.

Current projects include farming vast quantities of seaweed in the open ocean for a new type of carbon-neutral biofuel that might one day power trucks and airplanes. Unlike the corn- and soy-based biofuels used today, kelp-based fuels would not require valuable cropland. Other projects being funded include a system to recycle waste heat in Navy ships, small fusion reactors, and wind power (building huge turbines the length of a football field to be placed offshore to try to catch the steadier winds there; a prototype will be tested this summer at DOE's wind-testing center in Colorado). ARPA-E has connected the team with private companies

such as Siemens and the turbine manufacturer Vestas that can critique their work.

Facts on the ground

The maximum extent of Arctic sea ice cover this winter was the second-lowest since satellite record-keeping began. The loss of sea ice is a bellwether of global warming, suggesting that climate change is not just something to worry about far off in the future: It is here.

"We've probably known for 100 years that as the climate warms up in response to loading the atmosphere with greenhouse gases, we would see the changes first in the Arctic," said Mark Serreze, director of the National Snow and Ice Data Center in Boulder, Colo., which issued the new data. "This is what we expected and this is exactly what has happened. It's a case where we hate to say we told you so, but we told you so."

With each passing decade, the ice grows a bit less in winter, and melts a bit more in summer. The record for the least amount of sea ice gained in the winter was set last year. This winter's maximum extent was slightly greater. Despite the small increase this year, the downward trend in winter ice coverage is unmistakable, and the past four years have been the four lowest on record.

The disappearing sea ice is a key indicator of a warming Arctic. And the consequences of a warming Arctic can be felt further south. A growing number of researchers are linking the changes up north to unusual winter weather in North America and Europe. This past winter the northeastern US faced four nor'easters in as many weeks, and Western Europe encountered subzero temperatures that were far lower than at the North Pole.

These weather patterns are influenced by the jet stream, the river of wind that encircles the Northern Hemisphere. Temperature differences between the Arctic and the lower latitudes help create the jet stream. Because the Arctic is warming twice as fast as the rest of the Earth, that temperature difference is getting smaller. As a result, the jet stream is getting weaker and shifting its behavior, sending cold air south from the Arctic and pumping warm air north.

The weakening jet stream also helps keep weather patterns locked in place. Climate change is also producing changes in ocean currents which also play a role in weather systems but the influence of the Arctic ice is profound. And deeply disturbing. As one scientist put it, "What happens in the Arctic doesn't stay in the Arctic."

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Around the globe the impacts of climate change are being felt more quickly and with more impact than predicted. Warmer temperatures have produced more evaporation and either more rain and violent storms or the opposite extreme, draught and wildfire.

Lake Poopo, was once Bolivia's second largest lake, it is gone. Vanished into the thin air. Boats used by fisherman are stranded on the dry lakebed. Local inhabitants, the Urus, believe they are descendants of people who first settled on the Altiplano 3,700 years ago. Very few remain. The fish, waterfowl, gone. The residents who depended on the lake must move as the area is in drought. Village after village is abandoned. Just three decades ago this lake covered 3,000 square kilometers. That is the current speed of devastating change. In 2014 and 2015 the ever shallower lake suffered fish die-offs as water temperatures soared beyond the usual 60s and 70s Fahrenheit. Millions of carcasses floated belly-up at the surface. The recorded temperature of the lake reached 100.4°F!

Globally, climate change is warming many lakes faster than it's warming the oceans and the air. This heat accelerates evaporation and together with human mismanagement (dams in warm climate speeds evaporation, as does open irrigation), the result is water shortages, pollution, and loss of habitat for birds, fish and wildlife.

Warm water encourages bacterial growth. In eastern China's Lake Tai, farm runoff and sewage stimulate cyanobacterial blooms. The organisms threaten drinking-water supplies for two million people. The warming of East Africa's Lake Tanganyika threatens the supply of fish that feed millions of poor people in four surrounding countries. The water behind Venezuela's massive Guri hydroelectric dam has evaporated and been otherwise reduced to such critically low levels in recent years that the government has canceled classes for schoolchildren while rationing electricity. Even the Panama Canal, with its locks recently widened and deepened to accommodate supersize cargo vessels, is troubled by El Niño-related rainfall shortages affecting man-made Gatun Lake, which supplies not only water to run the locks but also fresh drinking water for much of the country. Low water levels have also forced limits on the draft of ships so the ships don't run aground in the lake.

Of all the challenges lakes face in a warming world, the starkest examples are in closed drainage basins where waters flow into lakes but don't exit into rivers or a sea. These terminal, or endorheic, lakes tend to be shallow, salty, and hypersensitive to disturbance. The Aral Sea has vanished from Central Asia and is a prime example of what is happening to such inland waters. In its case, in addition to climate change the main culprits were ambitious Soviet irrigation projects that diverted its nourishing rivers.

Terminal lakes on nearly every continent are following this pattern. Lake Chad in Africa is all but gone, heightening shortages of fish and irrigation water. Displaced people and refugees who now depend on the lake further strain this resource. Shortages as well as tensions in the hot, dry Sahel are driving conflict and mass migration. Utah's Great Salt Lake and California's Salton Sea and Mono Lake have undergone periods of recession too, diminishing critical breeding and nesting areas for birds as well as income from recreational boaters.

After the Caspian Sea, Iran's Lake Urmia was once the largest saltwater lake in the Middle East. It has shrunk 80 percent over the past 30 years. The flamingos that feasted on brine shrimp are mostly gone as are the pelicans, egrets, and ducks. Winds blow across the lake bed covering farm fields with salt dust rendering the soil infertile. Noxious, salt-tinged dust storms inflame the eyes, skin, and lungs of people 60 miles away in Tabriz, a city of more than 1.5 million. And in recent years Urmia's alluring turquoise waters have turned blood-red from bacteria and algae that flourish when salinity increases and sunlight penetrates the shallows. Few of the tourists who once flocked here for therapeutic baths can be found.

Refugees

The horrifying plight of desperate people fleeing their homes and countries continues. As I've written, climate change is a driving force exacerbating social and political tensions in Africa, the Middle East and elsewhere. Those lucky enough to survive the journey to a new country find they are not welcome. In fact, their presence has invigorated the rise of intolerance and right-wing politicians appealing to nativist, nationalist policy. And this is only the beginning. There is absolutely no reason to believe that the numbers of refugees will do anything but increase, by orders of magnitude, over the coming years and decades.

Those who are forced to relocate join a procession of people around the world who have been uprooted from their homes by climate-related environmental disruptions. The United Nations warned a decade ago that indigenous people would be among the first to be ravaged by climate change because so many rely on nature's bounty as subsistence hunters and fishermen. An estimated 23.5 million people fled their homes in 2016 because of food and water shortages, storms, floods, wildfires, extreme temperatures, and other weather-related disasters, according to the Norwegian Refugee Council's Internal Displacement Monitoring Centre. That exceeded the 6.9 million displaced by conflict and violence that year.

In sheer numbers those fleeing "natural" calamities have outnumbered those fleeing war and conflict for decades. Still, these figures do not include people forced to abandon their homelands because of drought or

gradual environmental degradation; almost two and a half billion people live in areas where human demand for water exceeds the supply. Rising atmospheric temperatures in the Andes over the past 40 years also have triggered the rapid retreat of its glaciers, melting half the ice that rings the Titicaca-Poopó basin threatening drinking water and agricultural water supplies. When glaciers first begin to melt, they provide an extra flush of water, but we've reached peak water in most glacial watersheds meaning, that meltwater from glaciers will now diminish in the region until it is gone. This pattern is repeated in most places around the planet.

Globally the likelihood of being uprooted from one's home has increased 60 percent compared with 40 years ago because of the combination of rapid climate change and growing populations moving into more vulnerable areas.

Most of these displaced people stay within their home countries. If they cross a border, they do not qualify for UN protections as refugees because they cannot claim they are fleeing violence or persecution. "We live in an era of the most forced migration since the Second World War," says William Lacy Swing, director general of the United Nations' International Organization for Migration. "This time, though, in addition to war, climate is looming as a major driver. We are going to need to support those who are ravaged by climate change so they can migrate with dignity."

Despite Gains in Renewables, Greenhouse Gas Emissions Rose Last Year

Roughly two-thirds of last year's emissions increase came from Asian countries that rely heavily on fossil fuels for economic development. Carbon dioxide emissions from the use of coal, oil and natural gas increased 1.4 percent globally in 2017 after holding steady for the previous three years. That's the equivalent of adding 170 million new cars to the road worldwide.

Emissions are rising fastest in Asia. Roughly two-thirds of last year's emissions increase came from Asia, where fast-growing countries like China, India and Indonesia continue to rely heavily on fossil fuels as they lift themselves out of poverty.

China, which is responsible for one-quarter of the world's industrial greenhouse gases, increased its emissions 1.7 percent in 2017, due to rapid economic growth and an increase in oil and natural gas use. The rest of developing Asia, including India and Indonesia, increased their overall emissions 3 percent.

That jump in Asian emissions overshadowed cuts made elsewhere in the world: The US reduced its emissions 0.5 percent last year due to the growing deployment of renewable energy. Britain, Mexico and Japan also cut their emissions. But the European Union over all increased emissions 1.5 percent.

Renewable energy is growing fast, but not fast enough. Renewable energy—including wind, solar and hydropower—was the fastest-growing energy source worldwide in 2017. China alone installed as many solar panels last year as the entire solar capacity of France and Germany combined. And the prices for renewable technologies keep falling.

Last year's unprecedented growth in renewables satisfied only about one-quarter of the increase in global energy demand as the world's economy boomed. Fossil fuels supplied the rest. The overall share of fossil fuels in global energy demand in 2017 remained at 81 percent, a level that has remained stable for more than three decades despite strong growth in renewables.

If the world wants to cut emissions quickly and meet the climate goals laid out in the Paris Agreement, clean energy will need to grow about five times as fast each year between now and 2040 as it did last year.

Coal Made a Small Comeback

Over the past few years, coal demand has plummeted around the world as countries like the US and China shift away from the most carbon-intensive of all fossil fuels. China has been pushing to phase out coal use in residential heating in order to clean up the severe air pollution that is choking its cities.

But coal use rebounded slightly in 2017, rising by 1 percent, driven in part by an increase in coal-fired power in Southeast Asia. A particularly hot summer in China also led the country to run its existing coal plants more often to power air conditioning. Another predicted, and ominous sign of things to come on a warming planet.

Yet despite last year's uptick, there is hope that coal consumption may decline. India's coal demand is growing at a slower pace than it did over the previous decade, as the country turns to solar power and other clean energy sources. Both China's and the world's coal consumption remains below the 2014 peak.

SUV Sales Keep Booming

Demand for oil rose 1.6 percent last year, much faster than the average annual pace over the previous decade. As oil prices have declined, more people in the U.S. and Europe are buying larger SUVs, pushing up transportation emissions further.

Electric cars, which do not use oil, are quickly making inroads in countries like China, as a result of aggressive government mandates and falling battery prices. For now, however, the strong growth in electric-car sales remains too small to make a dent in oil demand growth. But, as noted in earlier Blogs (4, 5, 6, 7, and 10), significant increases in the sale and use of EVs is expected worldwide.

Energy Efficiency Efforts Are Slowing

In addition to switching to cleaner sources of energy, countries can also curb their emissions by improving the energy efficiency of their factories and homes and vehicles, through policies like building codes and fuel-economy standards.

However, the bad news is that in 2017, the energy intensity of the global economy—a measure of efficiency—improved by just 1.7 percent, a slower pace than in each of the previous three years. Many countries appear to be easing up on government policies to improve energy efficiency.

Some Good News on Renewables

Over 100 cities produce more than 70 percent of their electricity from renewables. The transition to clean, renewable energy is a critical component of meeting Paris Climate Change Agreement goals, and cities around the world are increasingly taking up the challenge.

More cities than ever are reporting that they are powered by renewable electricity, sources such as hydro, geothermal, solar and wind.

The list includes large cities such as Auckland (New Zealand); Nairobi (Kenya); Oslo (Norway); Seattle (USA) and Vancouver (Canada), and is more than double the 40 cities who reported that they were powered by at least 70 percent clean energy in 2015.

The UK100 network of local government leaders announce that over 80 UK towns and cities have committed to 100 percent clean energy by 2050, including Manchester, Birmingham, Newcastle, Glasgow and 16 London boroughs.

Unsubsidized renewables were the cheapest source of electricity in 30 countries in 2017, with renewables predicted to be consistently more cost effective than fossil fuels globally by 2020.

Cities already powered by 100 percent renewable electricity include: Burlington, Vermont's largest city. The city has its own utility and citywide grid. In September 2014 the local community approved the city's purchase of its "Winooski One" Hydroelectric Facility. Mayor Miro Weinberger said, "Burlington, Vermont is proud to have been the first city in the United States to source 100 percent of our power from renewable generation. Through our diverse mix of biomass, hydro, wind, and solar, we have seen first-hand that renewable energy boosts our local economy and creates a healthier place to work, live, and raise a family. We encourage other cities around the globe to follow our innovative path as we all work toward a more sustainable energy future."

Reykjavik, Iceland sources all electricity from hydropower and geothermal, and is now working to make all cars and public transit fossil-free by 2040. Iceland has almost entirely transitioned to clean energy for power and household heating.

Basel, Switzerland is 100 percent renewable powered by its own energy supply company. Most electricity comes from hydropower and 10 percent from wind. In May 2017 Switzerland voted to phase out nuclear power in favor of renewable energy.

In the United States, 58 cities and towns have now committed to transition to 100 percent clean, renewable energy, including big cities like Atlanta (Georgia) and San Diego (California). Municipalities Denton (Texas) and St. Louis Park (Minnesota), became the latest communities to establish 100 percent renewable energy targets. In addition to these recent pledges, 23 other global cities have targeted 100 percent renewable energy.

New York City has targeted both the transportation sector and its buildings, two primary generators of GHGs. It set a goal of 20 percent of all vehicle registrations by 2025 should be EVs. And it has established energy efficiency standards for certain buildings. (See OneNYC, <http://www.nyc.gov/html/gbee/html/home/home.shtml>, and The NYC Carbon Challenge for Commercial Owners and Tenants.) And, NYC will be an important part of NYS reaching its goals of 40 percent reduction in GHG emissions by 2030, and 80 percent reduction by 2050, accomplished in part by getting 50 percent of our electricity from renewables by 2030. Which is to be reached, in part, by getting 2,400 MW of electricity from off-shore wind by 2030. Governor Andrew Cuomo announced a plan to create new energy efficiency targets and appliance standards and directed the state's Department of Public Service and the New York State Energy Research and Development Authority to propose new 2025 energy efficiency targets by April 22, 2018.

Much of the drive behind city climate action and reporting comes from the 7,000+ mayors signed up to The Global Covenant of Mayors for Climate and Energy who have pledged to act on climate change. Cities are responsible for 70 percent of energy-related CO2 emissions so these developments are significant.

Showing a diverse mix of energy sources, 275 cities are now reporting the use of hydropower, with 189 generating electricity from wind and 184 using solar photovoltaics. An additional 164 use biomass and 65 geothermal.

Cities are currently instigating renewable energy developments valued at U.S. \$2.3 billion, across nearly 150 projects. This forms part of a wider shift by cities to develop 1,000 clean infrastructure projects, such as electric transport and energy efficiency, worth over US \$52 billion.

Egypt Builds World's Largest Solar Park

Egypt has the natural potential to become one of the world's strongest energy players as it contains the three main natural elements to develop an abundance of energy: sunlight, wind and hydro-energy.

Despite that, Egypt has been failing to provide a stable source of electricity to its ever-growing population. The country imports oil despite having the largest oil refinery in Africa.

However, a recently announced project promises to provide the needed amount of clean, renewable solar energy to transform Egypt into a clean energy producer. The Benben SolarPark near the southern city of Aswan promises to transform Egypt into a major solar energy player in the world.

The ambitious project, set to be the largest solar park in the world, aspires to provide somewhere between 1.6-2GW of solar power by mid-2019. Egyptian officials believe the project will produce 20 percent of Egypt's power through renewable energy by 2020, which will serve 350,000 Egyptians and provide eco-friendly and cost-efficient power.

The Benben complex aims to include 32 solar plants on a 37.2 square kilometer area and will churn out 1650 megawatts of electricity, according to the World Bank's International Finance Corporation (IFC).

As Egypt's population increases, so does the demand for electricity. And that requires large investments in infrastructure. The government cannot afford such investment on its own so it has turned to the private sector for investors and financiers in the country for the first time. This should create jobs for many Egyptians and provide clean and reliable energy for people across the country.

The total cost of the project may range between U.S. \$3.5 billion and U.S. \$4 billion. The area will host 41 separate but contiguous spots in which each investor will create their individual project. These spots will be connected through a high-voltage network through four new substations. These substations will, in turn, be connected to an existing 220 kW line, which passes nearby the Benban site at a distance of approximately 12 km.

Before construction begins, all projects will sign a long-term, 25 years, usufruct agreement with the NREA. As for financing, the Multilateral Investment and Guarantee Agency (MIGA), an organization within the World Bank Group, is pitching U.S. \$210 million as political risk insurance for private investors to encourage them to put their money in the project, especially with Egypt's potential political instability.

The IFC and a consortium of nine international banks will finance 13 out of a total of 19 solar plants. The nine

banks are Africa Development Bank, Asian Infrastructure Investment Bank, Arab Bank of Bahrain, CDC of the United Kingdom, Europe Arab Bank, Finance in Motion, FinnFund, ICBC and OeEB of Austria, according to Forbes Middle East.

Morocco, Home to the Largest Existing Solar Energy Plant in the World

Morocco already has a giant \$9 billion solar facility, "Noor." It is owned by the state of Morocco and was built by a Spanish company SENER. The project is based in Ouarzazate, a tiny tourist town at the edge of the desert. Morocco lacks petrol and gas. To be independent it needs to create energy, and they have chosen to use clean energy, because of the climate change challenge.

Morocco has sunlight, about 3,000 hours of sun every year. And harnessing that light is an evolutionary leap for the country.

Noor uses CSP, or concentrated solar power. Concave mirrors direct the sun to a middle tube to heat an oil solution. The mirrors rotate as the sun moves, like sunflowers. The heated fluid, which reaches 750 degrees Fahrenheit, produces steam to power a turbine.

The king of Morocco is making a huge bet on clean energy. The goal is for renewables to power half of this country by 2040. Noor is the flagship project.

The North African nation says it wants to be the Saudi Arabia of solar energy, tapping its vast solar reserve. Morocco's king inaugurated Noor and flipped the plant's on switch in February of 2016.

Back in 2003, the think tank Club of Rome came up with an ambitious project called Desertec. The idea was to harness solar energy across the Sahara to power all of Europe. Now other organizations are implementing the Desertec concept.

The plan originally had ambitions to open solar energy farms across the Sahara, but the Arab Spring uprisings of 2011 and terrorist attacks on gas facilities in Algeria forced them to scale back. Geopolitical instability has always been the main obstacle for the implementation of these kind of projects.

CSP's critics say it isn't cost-effective. Noor's price tag was \$9 billion. Long-term, it could recover the investment if the technology doesn't become outdated too quickly. But it requires vast amounts of water. To supply the water engineers created a manmade lake. The solar complex uses about six million cubic feet of water each year, and that is about 1 percent of the storage capacity of the lake.

When Noor is finished later this year, it should provide electricity to over two million people. It has generated high expectations for Morocco and the future of solar power.

In Washington

Rex W. Tillerson, the former Secretary of State, despite his decades-long career in the oil industry—a major contributor to planet-warming greenhouse gases—believes that rising global temperatures from human activity pose significant risks. His replacement, Mike Pompeo, the former C.I.A. director, has questioned the scientific consensus that human activity is changing the climate, and he has strongly opposed the Paris Agreement, a pact among nearly 200 nations to address climate change. He told Congress last year during his Senate confirmation hearing for the CIA post that the notion of climate change as a top national security threat was “ignorant, dangerous and absolutely unbelievable.”

As noted in Blog 10, the CIA participated in a Worldwide Threat Assessment of the U.S. Intelligence Community that states that climate change contributes to national security threats.

The replacement of Tillerson with Pompeo furthers Trump’s increasingly hard-line opposition to the idea of climate change at the highest levels of the United States government. Tillerson’s departure follows the resignation of Gary Cohn, Trump’s top economic adviser, and the departure of George David Banks, a senior adviser to the president on international energy issues. All three had urged Trump to honor the Paris agreement.

EPA Administrator Scott Pruitt spoke to Trump about staging public debates challenging climate change science. Trump was receptive of the idea but John F. Kelly, the White House chief of staff, killed it saying it was ill-conceived and politically risky. Mr. Kelly is a retired four-star Marine Corps general who shares the pragmatic view held by military leaders, including Jim Mattis, the secretary of defense, that climate change is happening and poses a serious national security challenge.

The announcement of the debates would have coincided with the release of an exhaustive scientific report from 13 United States government agencies that definitively found human activity to be responsible for almost all of the warming that has occurred in the past half-century.

On Dec. 13, the White House convened senior officials to discuss the matter. The meeting included a presentation of the red team, blue team plan by two EPA officials—Mr. Pruitt’s chief of staff and the head of the agency’s air office. Other attendees included senior officials from the Department of Energy, the White House Council on Environmental Quality, the White House Office of Science and Technology Policy, and the National Economic Council. Every office within the White House was opposed to the idea and it was pronounced “dead” and was not to be mentioned again. Pruitt continues to say the idea is not dead.

The Arctic—Loss of Sea Ice and Its Global Implications; Changes in the Weather; Impacts on the Great Barrier Reef; Impacts in and Response by (the Red State of) Alaska; Some Good News—Rise of the Renewables

By Carl R. Howard

The clearest proof that climate change is occurring is observed at the poles. In the Arctic Ocean, some ice stays frozen year-round, lasting for many years before melting. But this winter, the area experienced a record low for ice older than five years. This, along with a near-record low for sea ice overall, supports predictions that by midcentury summers in the Arctic Ocean will be entirely icefree.

As darker, heat-absorbing water replaces reflective ice, it hastens warming, adding to a “positive feedback loop.” Older ice tends to be thicker than newer ice and thus more resilient to warming. But as the old ice disappears the newer ice left behind is more vulnerable to rising temperatures. The more ice melts the more water absorbs and warms, which hastens melting, and so on.

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Such conditions are especially bad for animals like narwhals, the so-called unicorns of the sea, that use sea ice to avoid predators like killer whales. As the sea ice disappears, killer whales spend more time in narwhal waters, eating the narwhals and driving them from the richest feeding grounds.

With each passing decade, the ice grows a bit less in winter and melts a bit more in summer. The record for the least amount of sea ice gained in the winter was set last year. The downward trend in winter ice coverage is clear. The past four years have been the four lowest on record. Repeated use of the word “record” is not a good thing.

The disappearing sea ice is a key indicator of a warming Arctic. The consequences of a warming Arctic are being felt globally.

Changes in the Weather

This winter (2018), the Northeastern U.S. faced four nor'easters in as many weeks, and Western Europe encountered subzero temperatures that were far lower than at the North Pole.

These weather patterns are influenced by the jet stream, the river of wind that encircles the Northern Hemisphere. Temperature differences between the Arctic and the lower latitudes help create the jet stream. Because the Arctic is warming twice as fast as the rest of the Earth, that temperature difference is getting smaller. The result is a weakening jet stream and shifting behavior sending cold air south from the Arctic and pumping warm air north. The weakening jet stream also tends to lock weather patterns in place. Scientists say that changes in ocean currents in the tropical Pacific are the source of the recent weather events in the mid-latitudes. But the weight of evidence reveals a significant Arctic influence.

The circulation of water currents in the oceans is crucial to the planet's weather systems and the continuation of conditions essential to life on earth as we've known it during human civilization. That is now changing. The ocean's circulation has not been this sluggish in thousands of years. And that is very bad news.

The Atlantic Ocean circulation that carries warmth into the Northern Hemisphere's high latitudes is slowing down because of climate change, suggesting one of the most feared consequences is here.

The Atlantic meridional overturning circulation (AMOC) has declined in strength by 15 percent since the mid-20th century to a new record low, a decrease of 3 million cubic meters of water per second, the equivalent of nearly 15 Amazon rivers.

The AMOC brings warm water from the equator up toward the Atlantic's northern reaches and cold water back down through the deep ocean. The current is partly why Western Europe enjoys temperate weather, and meteorologists are linking changes in North Atlantic Ocean temperatures to recent summer heat waves.

The circulation is also critical for fisheries off the U.S. Atlantic coast, a key part of New England's economy that has seen changes in recent years, with the cod fishery collapsing as lobster populations have boomed off the Maine coast.

Some of the AMOC's disruption may be driven by the melting ice sheet of Greenland, another consequence of climate change that is altering the region's water composition and interrupts the natural processes.

Climate models have long made such predictions and confirmation is building. One study suggests the slowdown probably began for natural reasons around the time of the Industrial Revolution in 1850, rather than being spurred by human-caused climate change,

which fully kicked in later. A second study finds that the circulation has remained weak, or even weakened further, through the present era of anthropogenic warming.

The research finds that the odd alignment, which has produced regions of record cold and record warmth right next to one another, has been developing since the 1950s and closely matches what a very high resolution climate model predicted.

If the slowdown trend continues, it is expected to drive strong sea-level rise against the Eastern Seaboard. Previous research has shown that from 2009 to 2010 sea level in the region suddenly shot up five inches thanks in part to a brief slowdown of the circulation. This occurs because the northward flow of the Gulf Stream pushes water east so that the ocean piles up against the coast of Europe. But as the current weakens some of the water flows back toward the U.S. East Coast instead.

As for the future, the circulation likely will weaken further as climate change advances. It may not be slow and steady. There is great fear that there may be a "tipping point" where the circulation comes to an abrupt halt.

This is one of the most infamous scenarios for abrupt climate change, as it is known. Studies from the planet's history suggest that such a sudden change in the North Atlantic has occurred many times in Earth's past, perhaps as recently as 13,000 years ago. But it's not clear how close the tipping point might be.

Some scientists predict that Greenland will start melting even faster, so the long-term prospect for that ocean circulation system is that it will weaken further, with immense repercussions that likely will affect humanity negatively. To put it mildly.

Impacts on the Great Barrier Reef

The oceans are a major sink, absorbing much of the CO2 from the air. Thus the impacts of climate change are readily apparent in the oceans including, among many other impacts, sea level rise, rising acidity, altered currents, altered weather patterns, and, as the waters warm, coral bleaching. Recent studies have concluded that damage to the Great Barrier Reef from global warming is irreversible.

Scientists said nearly one-third of the reef's coral were killed when ocean temperatures spiked in 2016, a result of global warming. The damage to the reef, one of the world's largest living structures, has also radically altered the mix of its coral species and is occurring faster than predicted. Corals are extremely sensitive to heat and an increase of two or three degrees Fahrenheit above normal can kill them.

The Great Barrier Reef has bleached four times since 1998. Record high temperatures in 2016 were followed by another bleaching event last year. The impact on the

health of marine life dependent on the reef, and the loss of tourist dollars, is immense and growing.

Impacts in and Response by (the Red State of) Alaska

The impacts of climate change are being felt in other northern regions such as Alaska. Sea level rise, erosion from increased wave activities, and the loss of protective sea ice may force 31 towns and cities to relocate at a cost of hundreds of millions of dollars. Alaska is a major oil and gas producer and a “red state” but conditions there are compelling local leaders to craft plans to address climate change. Ideas under discussion include cuts in state emissions by 2025 and a tax on companies that emit carbon dioxide.

The once solid permafrost that sits beneath many roads, buildings and pipelines is starting to thaw, destabilizing the infrastructure above.

In addressing climate change, Alaska will have to grapple with its own deep contradictions. Roughly 85 percent of the state’s budget is funded by revenues from the production of oil which is primarily exported to the rest of the US. Local politicians have largely been unwilling to curtail the supply of fossil fuels. Both Governor Walker and Lieutenant Governor Mallott supported the recent decision by Congress to open the Arctic National Wildlife Refuge to oil and gas exploration, a move opposed by environmentalists.

“The state will continue to be an energy producer for as long as there is a market for fossil fuels,” the men wrote in a recent op-ed for the *Juneau Empire*. But, they added, “We should not use our role as an energy producer to justify inaction or complacency in our response to the complex challenge of climate change.”

To that end, the state’s climate task force released a draft in April that included a proposal for Alaska to get 50 percent of its electricity from renewable sources like solar, wind, hydropower and geothermal by 2025, up from 33 percent in 2016. The draft also proposed cutting statewide greenhouse gas emissions one-third below 2005 levels by 2025, tackling sectors like transportation and “natural resource development,” which includes oil drilling operations.

Alaska, which ranks as the nation’s 40th-largest emitter overall but is fourth-largest on a per-capita basis, has already cut its emissions by 25 percent since 2005, driven by a drop in emissions from both aviation and industry. The state’s main climate impact, however, is through the oil that it exports to the rest of the country, where it is burned in cars and trucks.

“We need to have a revenue stream from nonrenewable energy that will allow us to invest in renewables,” Lieutenant Governor Mallott said.

As one possible approach, the draft proposal says that the state could consider a “carbon fee and dividend

program” that would tax carbon dioxide emitters and then reinvest the revenues in local energy efficiency and clean energy programs. The lieutenant governor also suggested that Alaska’s natural gas could be used to help reduce emissions in coal-reliant countries like China. (While natural gas is about half as carbon-intensive as coal, it produces more emissions than renewables or nuclear power.)

Any carbon tax proposal within the state will be opposed by Alaska’s oil and gas industry. There is broader consensus that the state will need to take more immediate action to prepare for the impacts of higher temperatures. The Arctic is already warming faster than the rest of the planet. Wildfires are growing larger during the Alaskan summer, menacing homes and roads. Native communities that rely on walrus hunting are seeing catches decline as sea ice disappears. And, in May, the rural village of Newtok received a \$22 million federal grant to help relocate residents threatened by erosion and flooding.

The state’s draft proposal urges more scientific research on threats like ocean acidification, which could threaten state fisheries, as well as new strategies to ensure food security in indigenous communities. By taking the lead on such efforts, the draft notes, Alaska could potentially export its adaptation know-how to the rest of the world.

Some Good News—Rise of the Renewables

Environmental concerns continue to drive power companies away from coal and toward natural gas which is currently the nation’s No. 1 power source. But technology and economics are rapidly leading in yet a newer direction. Some utility companies have scrapped plans for new natural-gas plants in favor of wind and solar sources that have become cheaper and easier to install. Existing gas plants are being shut because their economics are no longer attractive. And regulators are increasingly challenging the plans of companies envisioning new natural-gas plants.

A wind farm can literally be put on a train and brought online within a year, a time-scale no proposed gas plant can match. The Arizona Corporation Commission, which regulates the state’s investor-owned utilities, recently refused to endorse plans by three power companies proposing natural-gas facilities. Commissioners directed them to make greater use of energy storage and plants that produce zero emissions.

Some feel the push to get beyond natural gas may be too much, too soon. Officials at Arizona Public Service, the largest utility in the state, said they needed to include new natural-gas development as part of an overall mix, partly because of the state’s round-the-clock air-conditioning demands.

Nationwide, other utility executives, power producers and federal regulators have argued that a healthy power grid requires consistent power even in the absence of

sun and wind. The more solar and wind power that is added to the electric grid, they say, the greater the need for reliable backup sources like natural gas.

Gas proponents argue that even recent advances in storage do not justify an overreliance on alternative energy, however inexpensive.

Natural gas isn't likely to be unseated as the country's primary source of electricity generation anytime soon. In fact, utility companies plan to add more natural-gas plants than any other source, including all alternative energy sources like solar, wind and hydropower, combined.

But the calculus is rapidly shifting as the price of wind and solar power continues to fall. According to the Department of Energy, power generated by natural gas declined 7.7 percent in 2017.

And the latest report by Lazard, the financial advisory and management firm, found that the cost of power from utility-scale solar farms was now on a par with natural-gas generation—and that wind farms were less expensive still.

Lazard calculated the unsubsidized cost of wind power at 3 cents a kilowatt-hour, while natural gas and solar energy were a little more than 4 cents. The typical American household pays 12.5 cents a kilowatt-hour for electricity, according to the United States Energy Information Administration.

Moreover, the market equation in the West is driven largely by California, the sixth-largest economy in the world, which has mandated that 50 percent of its power be generated from renewable sources by 2030. With a regional energy market run by the state's electricity grid overseer, the California Independent System Operator, fossil-fuel plants have had increasing difficulty selling their power into a market with low-cost solar and wind power.

At the same time, state legislatures and regulators are increasingly demanding that utilities rethink how they manage their systems to reduce carbon emissions.

Some power producers resist the mandates, even scaling back their operations in certain markets because it is too difficult to compete without losing money.

NRG Energy, for example, announced this month that it would close three natural-gas plants in California because of the regulatory push for clean energy.

After NRG's announcement, Calpine, a power company based in Houston, said it would suspend plans to build a natural-gas plant in California.

But a big Oregon utility, Portland General Electric, has embraced clean-energy mandates to beat its dependence on fossil fuels. Portland General recently signed an agreement to buy surplus hydropower from the Bonneville Power Administration—the surplus arises largely from California's turn to other renewable

sources—helping the utility avoid construction of natural-gas plants to replace a coal facility.

Portland General's view offered a hopeful message to environmentalists, who oppose the use of coal and are fighting a similar battle with natural gas.

Utilities found that coal was not just a dirty form of energy but more expensive, so they replaced it with natural gas and now they're experiencing the same process and moving toward renewables. There's a broad trend across the energy sector, mostly in the West, where coal and natural gas can't compete. Such a rapid change has caught many in the industry by surprise and it could lead to a shorter future for natural gas which contributes to climate change.

Meanwhile, in D.C.—Solar Tariffs

SunPower is the nation's No. 2 commercial solar-power company, employing thousands of workers directly and indirectly. But its solar panels are manufactured abroad and with the Trump tariffs costing it as much as \$2 million a week SunPower is fighting for an exemption.

One of its rivals, SolarWorld Americas, produces panels domestically. Buffeted by foreign competition, it was behind the original push for the tariffs.

These two American companies are merging.

It's all part of the disruption, distortion and uncertainty from an escalating U.S. trade offensive aimed primarily at China. In about three months, the tariffs are fundamentally reshaping the solar industry and its prospects.

A Chinese entity announced plans to open a factory in Florida, perhaps this Fall. With its SolarWorld acquisition, SunPower moved to prevent further loss to its business by locating a bigger share of its production in the US. Both companies are being hit with tariffs on high-efficiency panels they produce in Malaysia.

Those efforts only blunt the negative effects of the industry fallout. While producing more panels in the U.S. will create a few hundred jobs, the tariffs could cost tens of thousands of jobs, largely affecting installation. Dozens of solar companies are now petitioning to be exempted from the tariffs, and a bipartisan group in Congress has introduced a bill to overturn.

The tariffs have slowed growth in the solar industry, which means jobs are not being created. The tariffs could cost as many as 23,000 American jobs this year. In addition, the 30 percent tariffs are going to make it more expensive for cities across the country to pursue their goal of promoting solar power as a way to curb carbon pollution.

The solar industry expects to continue adding installations, but growth is estimated to be about 11 percent lower than projections before the tariffs.

The office of the United States trade representative, which is handling the tariffs, is reviewing the requests from SunPower and other companies for exemptions. No time frame for a decision has been set.

To be excluded, the companies must show that they have a unique technology or offering. SunPower, based in San Jose, Calif., said its products served a need unmet by existing American manufacturers, and were made overseas for proximity to its suppliers, largely in Asia, making the solar panels cheaper.

The effect of the tariffs on the cost of imported solar panels makes it more difficult to compete with other sources of power like wind, or even makes fossil-fuel plants look attractive again. Regarding jobs, SunPower is taking over an operation with 280 employees but has not determined how many jobs it might add.

JinkoSolar, a Shanghai company, announced this year that it would start manufacturing in Jacksonville, Fla., and create about 200 jobs. It already has a deal with Florida-based NextEra Energy to supply the parent company of Florida's largest utility with seven million panels over four years—one of the largest orders to date.

JinkoSolar said it still needed exclusion from the tariffs to bring any significant scale to its American operations. While it will assemble panels in the U.S., the solar cells will continue to be produced in Asia and subject to tariffs. To expand, and add jobs, the company will need an exemption.

Even as those projects bring prospective jobs, the Solar Energy Industries Association pointed to the potential job losses from the suspension or termination of solar projects

because of higher costs. It said domestic operations alone could not meet the previous level of demand.

Solar energy enjoyed a banner year in 2016, when there was a rush to get projects going before a federal tax credit on solar projects was to expire. In that year, it became the nation's leading source of new electricity generation.

But after that flurry, solar yielded its No. 1 spot even though Congress extended the 30 percent tax credit through 2019. Now the tariffs have added another bump in the road for solar power.

Before the tariffs, the industry was expected to have the capacity to power 13.7 million homes nationwide by 2022. That estimate has been revised downward by more than 10 percent.

Congress might repeal the tariffs via a bill now before lawmakers. Representative Jacky Rosen, a Nevada Democrat, introduced the bill out of concern over the loss of jobs in her state.

Two South Carolina Republicans, Representatives Mark Sanford and Ralph Norman, backed the legislation, citing not only jobs but also the added cost the tariffs imposed on business. The bipartisan nature of the effort gives the industry hope that it might find support.

Solar power, which now generates almost 2 percent of the nation's electricity, has become popular among Democrats and Republicans alike, as people favor increased control over their energy use, reduced pollution as well as job creation.

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Fraud, Free Speech and Fossil Fuel: Lessons From Big Tobacco for Big Oil

By Anna Baxendale

I. Introduction

Recent investigations by InsideClimate News (ICN)¹ and the *Los Angeles Times* ("*LA Times*")² revealed that ExxonMobil ("*Exxon*") carried out research beginning in the late 1970s indicating fossil fuel's dangerous role in global warming. However, rather than act on its groundbreaking research, and continue as a leader in the climate change field, Exxon chose a different path. For the next few decades, Exxon instead became a leader in climate change denial, stressing uncertainty, propagating misinformation, funding denial, and politicizing and undermining the expert consensus on anthropogenic climate change.

Exxon's conduct invoked the tactics used by the tobacco industry years earlier, tactics which wound up the subject of a successful federal government lawsuit under the Racketeer Influenced and Corrupt Organizations Act (RICO). The parallels with the tobacco industry prompted legislators and environmentalists to call on the Department of Justice to use RICO again to hold the fossil fuel industry to account.

In this context, this article will consider: (1) the legal issues associated with bringing a claim under RICO, and the New York and California state equivalents, and (2) whether useful lessons can be drawn for climate litigation from experiences with tobacco litigation.

II. Overview of RICO

In the mid-20th century, the United States found itself facing an organized crime epidemic. The Mafia presented unusual problems for law enforcement; the way in which the organization structured its activities made it impervious to conventional criminal prosecution. While individuals at the bottom of the organization were prosecuted, the Mafia family who reigned over them remained untouched. Concerned that organized crime was weakening the U.S. economy, harming investors and competing businesses, interfering with competition, and undermining citizens' welfare,³ Congress enacted RICO on October 15, 1970.⁴ Congress intended RICO as a tool that would target not only individuals, but also the "economic base through which they threatened the nation."⁵ In the years since its enactment, in accordance with congressional mandate,⁶ courts have interpreted RICO liberally, extending its reach beyond organized crime to apply to legitimate businesses.⁷

RICO provides for both civil⁸ and criminal⁹ remedies, the key difference between the two being the standard of proof required for a finding of guilt.¹⁰ RICO's civil provision permits both the federal government¹¹ and private

litigants¹² to bring suit for RICO violations. This article is concerned primarily with the civil RICO action available to the federal government. However, at Part IV Section E below I will briefly discuss some requirements for, and challenges associated with, a civil RICO action brought by a private litigant.

III. Overview of Tobacco Epidemic and Litigation in the U.S.

A. The U.S. Tobacco Epidemic

The cigarette occupied an iconic position in mid-century America, a position exploited and fomented by the tobacco industry through innovations in marketing and product design. Though research into the harmful effects of smoking had begun to emerge in the first quarter of the 20th century, it was not until the early 1950s that scientific opinion converged.¹³ In 1953, when cigarettes were categorically linked to lung cancer, the tobacco industry faced a "crisis of cataclysmic proportions."¹⁴ Its response was immediate and unparalleled. In December 1953, tobacco industry executives gathered at the Plaza Hotel in New York City. There, they developed a strategy, buttressed by a public relations campaign, whereby aggressive advertising would be bolstered by a full-frontal assault on the scientific domain. For the next 45 years, the tobacco industry would work to undermine the science that threatened to devastate sales of their highly lucrative product, engineering scientific knowledge to counteract what had become known.¹⁵

B. *United States v. Philip Morris*

Over the next few decades, attempts to regulate cigarettes were repeatedly thwarted. When public health advocates failed to breach the ramparts of Washington politics, they turned to the courtroom. The history of tobacco litigation is commonly referred to as occurring in three separate waves, each involving different legal strategies and theories.¹⁶ The first wave of litigation was based primarily on theories of breach of warranty and negligence, the second on tort liability, and the third involved primarily state government actions for reimbursement of Medicaid funds, and class actions.

The tobacco industry adopted a number of different strategies in response to each wave; two of the notable trial defenses included alleging lack of causation and assumption of risk. The causation attack was twofold, first challenging the plaintiff and their lifestyle, and second the 1964 landmark Surgeon General's Report on Smoking, on the basis that the underlying research was unscientific and deficient.¹⁷ This strategy was successful, with the result that many juries did not believe smoking to be

the legal cause of plaintiffs' injuries.¹⁸ The assumption of risk theory was conversely based on the argument that the public knew that smoking was potentially harmful, but chose to do it anyway.¹⁹ Toward the end of the second wave, the tobacco industry was able to proclaim that, after nearly four decades of litigation, it had not paid out "a penny in damages."²⁰ The tables turned during the third wave of litigation, at which point plaintiffs benefitted from an armoury of internal tobacco industry documents that had been disclosed during prior litigation.

At that time, RICO's potential did not go unnoticed. For a number of years, hospitals, health and welfare funds, and even foreign governments, sought to utilize RICO's broad reach to recover damages for the costs of treating tobacco-related illness. However, their claims were repeatedly unsuccessful, with courts commonly finding either that plaintiffs lacked standing due to deficiencies in the alleged causation,²¹ or that the loss suffered was too remote.²²

In 1999, the U.S. government launched what was to be the first successful lawsuit brought against Big Tobacco under RICO.²³ In its complaint, the government alleged that the tobacco industry had participated in a four-decade long conspiracy to "intentionally and willfully deceive and mislead the American public about, *inter alia*, the harmful nature of tobacco products, the addictive nature of nicotine, and harmfulness of low tar cigarettes."²⁴ In order to perpetuate this fraud, tobacco companies had made false and misleading statements about smoking and nicotine "in public, Congress, and in court;"²⁵ created public relations bodies to ensure the circulation of misleading statements;²⁶ engaged in deceptive marketing;²⁷ suppressed and concealed documents;²⁸ and limited research into the linkages between smoking and disease.²⁹ Pursuant to these allegations, the government sought injunctive relief and the disgorgement of around \$280 billion in profits.

On August 17, 2006, the United States District Court for the District of Columbia handed down a historic opinion,³⁰ marking the beginning of the end for the U.S. government's unprecedented lawsuit. In an opinion spanning 1,672 pages, the court found the tobacco company defendants, and certain associated organizations, liable for fraud and conspiracy under RICO, for false and misleading representations made to the public about the devastating health effects of smoking.³¹

The court ordered several remedies, including: a ban on cigarette descriptors conveying health claims;³² corrective statements about, *inter alia*, nicotine addiction and the adverse health effects of smoking;³³ facilitating public access to certain internal industry documents;³⁴ and an injunction from making false or misleading public statements about cigarettes.³⁵ The court rejected certain other remedies proposed by the government, notably corporate structural changes,³⁶ disgorgement of profits,³⁷ a smoking-cessation program, and the implementation

of a campaign educating the public about the hazards of smoking,³⁸ on the basis that such remedies exceeded the government's authority under RICO.

IV. Overview of Climate Change in the U.S. and the Possibility of Bringing a RICO Claim

A. Climate Change: A Brief History and What Exxon Knew

In 1896, Swedish scientist Svante Arrhenius made a bold claim: fossil fuel combustion was leading to increased levels of carbon dioxide in the Earth's atmosphere, which, in time, would cause the Earth's average temperature to rise.³⁹ Arrhenius calculated that, should humans double the amount of carbon dioxide in the air through burning fossil fuels, the Earth's average temperature would increase by around five or six degrees Celsius.⁴⁰

Arrhenius' calculation turned out to be somewhat high. However, by the 1970s climate curiosity had turned to concern, and many climate scientists had become convinced that climate change posed a threat.⁴¹ Despite converging consensus in the world of science, by the end of the decade, public concern as a whole was tepid. Most considered climate change a somewhat interesting issue, though much less pressing than others.⁴² Around the same time, however, Exxon's all-powerful management committee received some bad news: "there is general scientific agreement that the most likely manner in which mankind is influencing the global climate is through carbon dioxide release from the burning of fossil fuels."⁴³ Moreover, "man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical."⁴⁴

This stark warning prompted Exxon to launch extensive research into fossil fuel combustion and its impact on the Earth. Exxon's research culminated in an internal briefing on the greenhouse effect, which confirmed prior concerns raised by company scientists.⁴⁵ The briefing anticipated that mitigating the greenhouse effect would require "major reductions in fossil fuel combustion,"⁴⁶ and, though the time frame was uncertain, "once the effects [become] measurable, they might not be reversible."⁴⁷

In the summer of 1988, then the hottest on record, climate awareness was also on the rise. An international gathering of scientists cautioned that the world should be proactive in reducing greenhouse gas emissions,⁴⁸ and the United Nations formed the Intergovernmental Panel on Climate Change (IPCC) shortly after. Just as the IPCC published its first report in 1990,⁴⁹ confirming past and likely future global warming, Exxon turned away from its own research and the international scientific consensus, choosing instead a path of uncertainty and deceit. Since then, the certainty of climate change has compounded year after year,⁵⁰ and today there is an overwhelming scientific consensus that anthropogenic emissions of GHGs

are impacting the Earth's climate.⁵¹ Though climate change is expected to affect different regions in different ways, evidence indicates that, taken as a whole, the net costs are likely to be substantial, and to escalate over time.⁵²

B. Could the Department of Justice Bring a Claim Against Big Oil for Climate Change Fraud Under RICO?

This section will consider the viability of a government civil RICO action for climate change fraud, addressing each of the violations that were at issue in *Philip Morris*, namely (1) using an enterprise to conduct a pattern of racketeering under section 1962(c), and (2) conspiracy to undertake such conduct under section 1962(d).

1. Section 1962(c): Conduct Through a RICO Enterprise

In order to bring a successful claim under § 1962(c), the plaintiff must show, by a preponderance of the evidence, that (a) the defendants comprised an enterprise, and (b) that each defendant participated in the conduct, management and operation of the enterprise (c) through a pattern of racketeering activity.⁵³ The plaintiff must also show a reasonable likelihood of future RICO violations occurring, which may be inferred from a pattern of past conduct.⁵⁴

a) Enterprise

RICO defines "enterprise" as "any individual, partnership, corporation, association, or other legal entity, and any union or group of individuals associated in fact."⁵⁵ The enterprise must be an entity (formal or informal) distinct from the defendants; it is not enough that the defendants merely acted together to commit the wrong.⁵⁶ It is not necessary that the enterprise have a hierarchical structure or chain of command, regular meetings, regulations or procedures, or defined roles;⁵⁷ however, a RICO complaint requires more than a "string of entities that assertedly make up an 'association in fact.'"⁵⁸ The *Philip Morris* enterprise was found to be comprised of individuals and corporations associated-in-fact, together with their agents and employees.⁵⁹ The way in which the fossil fuel industry organized its climate change strategy looks very similar to the tobacco industry, including, for example, the use of front groups to coordinate research, manage PR campaigns, and engage in lobbying.⁶⁰ As such, the *Philip Morris* analysis provides a useful analogy, and it is likely that the enterprise would similarly be found to be comprised of various persons, companies, and trade organizations "associated-in-fact." Showing an associated-in-fact enterprise requires three elements: (i) proof of a common purpose, (ii) relationships among associates, and (iii) longevity sufficient to permit the associates to pursue the enterprise's purpose.⁶¹ The law defining the test for an associated-in-fact enterprise has changed slightly since *Philip Morris*, though the elements remain notionally similar.⁶²

(i) "Common Purpose"

A common purpose may be shown by direct and circumstantial evidence, including financial relations, coordination of activities, a community of interests and aims, and the overlapping nature of the wrongful conduct.⁶³ In *Philip Morris*, the defendants' common purpose was identified as the maximization of profits, achieved through protecting and enhancing the cigarette market.⁶⁴ This purpose could be identified from internal documents in which the defendants recognized that they would benefit from working together on their "common problem."⁶⁵ A similar purpose might be assigned to the fossil fuel industry, inferred, for example, from the American Petroleum Institute's⁶⁶ (API) draft Global Climate Science Communication Action Plan, that "[v]ictory will be achieved when: average citizens "understand" (recognize) uncertainties in climate science...[the] Media "understands" (recognizes) uncertainties in climate science...[and] those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality."⁶⁷ Financial ties may be inferred, for example, from the industry's joint financing of the Global Climate Coalition (GCC), a group representing the interests of the fossil fuel industry much like the Council for Tobacco Research (CTR) represented those of the tobacco industry.⁶⁸

(ii) "Relationships"

In *Philip Morris*, the court found that the tobacco enterprise operated through both formal and informal organization;⁶⁹ evidenced by the formation and activities of trade organizations, including CTR and the Tobacco Institute.⁷⁰ As noted above, the fossil fuel industry similarly organized its climate activities through trade organizations, which represented its interests, including the GCC. Though the GCC was disbanded in 2002, the *Philip Morris* court found that the fact that an organization had been dissolved some time prior to the litigation did not affect the existence of the enterprise, or the organization's inclusion in it, as such organization could be resurrected at the defendants' behest.⁷¹

(iii) "Longevity"

Longevity requires that the enterprise function as a continuous unit and remain in existence long enough to pursue the relevant purpose.⁷² This requirement will be met even by "spurts of activity punctuated by periods of quiescence."⁷³ In *Philip Morris*, the equivalent test was "continuity," and this was demonstrated by communication between the defendants relating to the enterprise, the joint funding and directing of various organizations, and the maintenance of the defendants' position over the relevant period.⁷⁴ On the basis of this analysis, and the foregoing discussion, longevity should not be a significant hurdle in the context of climate litigation.

(iv) "Effect on Interstate and Foreign Commerce"

The enterprise must have some nexus to interstate commerce. An enterprise has a nexus to interstate com-

merce when it is “directly engaged in the production, distribution, or acquisition of goods and services in interstate commerce.”⁷⁵ This requirement will be satisfied if either the enterprise or the racketeering activity affect interstate commerce.⁷⁶ In *Philip Morris*, the fact that the defendants, collectively, had bought and sold over \$1 trillion of goods and services in interstate and foreign commerce since 1954 constituted the requisite effect on interstate commerce.⁷⁷ Between 2010 and 2015 alone, revenues of the oil and gas industry in the U.S. are estimated to be in excess of \$1 trillion.⁷⁸ Thus, on the basis of the reasoning in *Philip Morris*, an effect on interstate and foreign commerce would readily be shown.

b) Conduct

Each defendant must have participated in directing the affairs or management of the enterprise, not merely its own affairs.⁷⁹ A defendant may be deemed to have “participated” even if he did not have significant control over the enterprise’s affairs⁸⁰ or a formal position in the enterprise. Further, there is no requirement that he know all the details, or even the other members;⁸¹ it is sufficient that he “[knew] the general nature of the enterprise and [knew] that the enterprise [extended] beyond his individual role.”⁸²

In *Philip Morris*, the bar to establishing “participation” was set relatively low. Participation was found by each defendant’s involvement in trade organizations, supporting the enterprise’s objective, coordinating and causing the public dissemination of fraudulent statements in furtherance of the common purpose,⁸³ and the regular meetings and correspondence between defendants.⁸⁴

c) Pattern of Racketeering Activity

As in the tobacco litigation, it is likely that the relevant racketeering activity for the fossil fuel industry would be mail or wire fraud under 18 U.S.C. § 1341 or 1343. To establish mail or wire fraud, the plaintiff must show that the defendant: (i) devised or intended to devise a scheme for obtaining money or property, (ii) by means of material false or fraudulent statements, (iii) used the mail, telephone, or other electronic communication, for the purpose of furthering the scheme, and (iii) acted with specific intent to deceive or defraud.⁸⁵

(i) “Scheme to Defraud”

Unlike common law fraud, the mail and wire fraud provisions require neither reliance by, nor injury to, the alleged victim,⁸⁶ though it must be shown that the schemer contemplated some harm or injury to occur as a result of the scheme.⁸⁷ The statute’s purpose is to punish the scheme, not its success.⁸⁸ As such, in a government civil RICO claim, the key element to establish is not actual fraud,⁸⁹ but rather a scheme aimed at inducing reliance on a known misrepresentation.⁹⁰ This aligns with the remedies available to the federal government, which aim to prevent or restrain future violations, rather than compen-

sate for past conduct.⁹¹ Courts have typically interpreted the “scheme to defraud” requirement broadly, finding the existence of a scheme to defraud where there has been any “trickery, deceit, half-truth, concealment of material facts, or affirmative misrepresentation.”⁹²

In *Philip Morris*, the tobacco industry had repeatedly made public statements that smoking was neither harmful⁹³ nor addictive,⁹⁴ flying in the face of internal and external scientific research, which emphatically stated the opposite.⁹⁵ The scheme to defraud was accordingly found to be comprised of fraudulent statements in several areas, including misrepresenting and concealing the adverse effects of smoking, maintaining that there was an “open question” as to the adverse effects of smoking, despite knowing otherwise, and ensuring that research and development, and marketing efforts, remained consistent with the defendants’ chosen public position.⁹⁶

Parallels can readily be drawn between the tobacco companies’ behavior, and that of Exxon, as disclosed in the ICN and *LA Times* investigations. However, the climate change issue is less clear-cut than that of smoking, particularly as regards timing and magnitude, and this was only more true 40 years ago. These uncertainties present challenges of nuance when it comes to statements made in the climate change context, though, on the basis of courts’ liberal interpretation of “scheme to defraud,” this should not bar a finding of deceit. To illustrate the point, in 1996, Exxon’s then CEO, Lee Raymond, observed, “Currently, the scientific evidence is inconclusive as to whether human activities are having a significant effect on the global climate.” If “inconclusive” is a synonym for “uncertain,”⁹⁷ then in some sense Raymond was right. At that time in particular, the ability to quantify the human influence on global climate was limited by uncertainties in key areas, including natural variability and land surface changes.⁹⁸ However, “inconclusive” is the wrong lens through which to view climate change; it says nothing of degree. Raymond was framing climate change as a glass one third empty, as opposed to a glass two thirds full. His statement was a “half-truth.” Internal⁹⁹ and external¹⁰⁰ understanding at the time reflected the well-established scientific consensus that humans were likely having a significant impact on the global climate.

As a second example, a 1998 Exxon pamphlet entitled, “Global Climate Change Everyone’s Debate,”¹⁰¹ stated that “[n]early all CO2 emissions come from natural sources. Only a small amount comes from burning fossil fuels...Does the tiny portion of greenhouse gases caused by burning fossil fuels have a measurable effect on worldwide climate? No one knows for sure.”¹⁰² While this statement is, in part, correct, taken in isolation, it is misleading. The amount of carbon dioxide emitted by natural sources is almost perfectly balanced with the amount taken out of the atmosphere by plants. While CO2 derived from fossil fuel combustion does form a small part of the global carbon cycle, that small part has

a large impact, as the natural carbon exchange cannot absorb all the additional CO₂. That was known in 1998. Furthermore, as early as 1990 the IPCC was “certain” that “[e]missions resulting from human activities [were] substantially increasing the atmospheric concentrations of greenhouse gases... resulting on average in an increase in global warming.”¹⁰³

Some statements made were categorically false. For example, speaking in 1997, the warmest year on record,¹⁰⁴ Raymond observed, “Satellite measurements have shown no warming trend since the late 1970s. ‘In fact,’ he resolved, ‘the Earth is cooler today than it was 20 years ago.’”¹⁰⁵ Wrong. The Earth’s surface temperature had in fact been rising during that period, as acknowledged both internally by the GCC,¹⁰⁶ and externally, by the IPCC and the National Oceanic and Atmospheric Administration, among others.¹⁰⁷ Categorically false or not, the mail and wire fraud statutes cover a variety of fraudulent or misleading statements, including those that are literally true but deceptive in the context in which they are made.¹⁰⁸ The examples discussed above would seem to fit the bill regardless.

Finally, of paramount significance for finding a scheme to defraud in *Philip Morris* was the fact that the defendants’ internal documents “openly acknowledge[d] the purpose of their public relations strategy.”¹⁰⁹ Again, parallels may be drawn with the fossil fuel industry here. For example, an internal Exxon briefing, acknowledging that “the greenhouse effect may be one of the most significant environmental issues for the 1990s,” stated that, despite that issue, the corporation’s strategy was to “emphasize the uncertainty” of the scientific data supporting the existence of climate change.¹¹⁰ The API’s Global Climate Science Communication Action Plan,¹¹¹ discussed above, stated that its campaign would achieve “victory” when “average citizens ‘understand’ uncertainties in climate science.”¹¹² The API’s proposed plan involved “a national media relations programme to inform the media about uncertainties in climate science” and the coordination of “scientific critique of the IPCC research and its conclusions.”¹¹³ In order to execute this plan, the API sought to recruit scientists “without a long history of visibility in the climate debate” so as to amplify “scientific” views consistent with theirs.¹¹⁴ The API also aimed to target teachers and students in order to obstruct the imposition of “Kyoto-like measures” in the future.¹¹⁵

(ii) Material False or Fraudulent Statements

Materiality is a key element of the mail and wire fraud statutes.¹¹⁶ A statement will be considered material if it has the capacity or natural tendency to influence a decision,¹¹⁷ if it carries some “probative weight” for a person in reaching a decision.¹¹⁸ In *Philip Morris*, the court emphasized the definition of materiality found in the Second Restatement of Torts, which holds that a matter will be material if (1) a reasonable person would attach importance to it in determining their course of action,

and (2) the representor knows or has reason to know that the recipient is likely to regard the matter as important in determining their course of action, even though a reasonable person would not.¹¹⁹

Given the stakes involved in climate change, it is unlikely that materiality should pose much of a hurdle here. It is difficult to imagine that a “reasonable person,” when assessing the costs and benefits of continued fossil fuel use, would not consider the catastrophic environmental impacts predicted to occur as a result material. Further, there can be no doubt that statements made by the world’s biggest oil company, and one of the world’s largest corporations, denying the effects of climate change would carry particular weight with both consumers and politicians. However, we need not rely on conjecture. In a June 2001 briefing memorandum, a State Department official is recorded as thanking the GCC, at the same time President Bush “rejected the Kyoto Protocol in part, based on input from [the GCC].”¹²⁰ Further, studies have confirmed the significant influence that private funding has had on the misinformation and the polarization of the climate change issue in the U.S.¹²¹

Though materiality should not pose much of an obstacle, a couple of arguments advanced in *Philip Morris* warrant discussion here, as it could reasonably be anticipated that they might arise during hypothetical climate litigation. First, the tobacco defendants argued that the fact that there existed in the public domain information contrary to their representations meant that no “reasonable consumer” would have relied on those representations. That argument, in the court’s words, “strains credulity.”¹²² In reaching this conclusion, the court was struck by the fact that the defendants were a primary source of information on smoking and tobacco and that the public health community had both a less sophisticated understanding, and less resources, to disseminate information than the tobacco industry.¹²³ This is relevant to the climate change context, as during the period in which the fossil fuel industry was perpetuating its deceit, contrary information did indeed exist in the public domain. However, the reasoning in *Philip Morris* suggests that this may not render misleading statements deemed immaterial. More particularly, the cutting-edge research that Exxon carried out during the 1970s and 1980s confirms that it was, and could have been, a trailblazer in the climate change field. This, together with its status as the world’s biggest energy company, left Exxon well-positioned as an authority on energy matters, and its word of importance to many. Further, the *Philip Morris* court noted that the defendants’ definition of materiality, which focused only on the first limb of the Second Restatement test, was insufficient,¹²⁴ and the huge amounts spent on advertising each year was indicative of the importance the defendants believed recipients attached to their representations.¹²⁵ A similar question might be asked of the fossil fuel industry: why invest so much in advertising,

PR, and lobbying, if it was considered that politicians and citizens would not consider the message material?

(iii) "Use of Mailings and Wires in Furtherance of the Scheme"

In our modern world, establishing mail or wire communications across state lines is not a high threshold to meet; almost all commercial activity will involve remote communication. The plaintiff need only show a causal relationship between the mailing, or use of the wires, and the scheme to defraud; in other words, the transmissions themselves need not be fraudulent.¹²⁶ Further, the mail or wire transmissions may be incidental to the scheme; they need not form an essential part of the scheme in themselves.¹²⁷ In *Philip Morris*, the court found that the defendants fulfilled this requirement by virtue of their use of U.S. mail, as well as their use of fax machines, the Internet, television, and email, to transmit documents or statements.¹²⁸ Where a defendant publishes advertisements and press releases in newspapers, which are then disseminated via U.S. mail, or where a statement is broadcast on television or published on the Internet, this requirement will be met.¹²⁹

In addition to showing the use of mails or wires, it must be shown that the defendant caused those transmissions. In this respect, "[w]here one does an act with knowledge that the use of the mails [or wires] will follow in the ordinary course of business, or where such use can reasonably be foreseen even though not actually intended, then [the defendant] 'causes' the mails to be used."¹³⁰ In *Philip Morris*, it was found reasonably foreseeable that the defendants' representatives' statements would be broadcast to the public in light of their routine mailing practices.¹³¹ This is not a high threshold to meet.

(iv) "Specific Intent to Defraud or Deceive"

Mail and wire fraud are specific intent offenses.¹³² As the statute does not require actual fraud, proof of fraudulent intent is key.¹³³ Specific intent in this context means intent to defraud, rather than intent to violate a statute.¹³⁴ Fraudulent intent may be inferred from a "material misstatement of fact made with reckless disregard for the truth,"¹³⁵ or, from the scheme itself, where the necessary result of the scheme is to injure others.¹³⁶ Courts have generally found that fraudulent intent is rarely susceptible of direct proof, and therefore may be inferred from the circumstances.¹³⁷ Thus, in *Philip Morris* the court held that the requisite intent was established by "statements which were directly contrary to the internal, collective knowledge of each individual Defendant and the Enterprise as a whole."¹³⁸ Where statements were made by individuals, the court held that the doctrine of respondeat superior applied, and thus the defendants' specific intent was established by the collective knowledge of their officers, employees and agents.¹³⁹ As discussed above, specific intent may fairly be inferred from internal documents discussing climate change PR strategy,¹⁴⁰ and from incongru-

ity between internal research and external statements and publications.

Lastly, good faith is a complete defense to mail and wire fraud charges.¹⁴¹ Thus, if a person believes that the information included in communication is true, then specific intent will not be found.¹⁴² Distinguishing good faith from reckless disregard is the topic of the next section of this article.

(v) First Amendment Issues

In a letter last year, 13 Attorneys General observed that "a vigorous debate exists in this country regarding the risks of climate change and the appropriate response to those risks."¹⁴³ In the letter, the signatories urged their fellow Attorneys General: "stop policing viewpoints."¹⁴⁴ Robust and uninhibited public debate is indeed the cornerstone of the First Amendment.¹⁴⁵ Furthermore, there is nothing per se improper about self-interested speech and commercially interested research. However, in *Philip Morris* the court denied the defendants' argument that their public statements were simply "statements of opinion held in good faith."¹⁴⁶ This begs the question: where is the line between statements of opinion and statements constituting fraud? The court in *Philip Morris* noted several factors that differentiated the two types of speech.¹⁴⁷ First, the court held that, in light of what the enterprise as a whole and individual defendants knew, it was absurd to believe that they were not aware that their public statements were false.¹⁴⁸ Second, the court noted the fact that the relevant statements were at odds with the internal knowledge and practice of the defendants.¹⁴⁹ Finally, in circumstances where objective data exists to prove that a statement was misleading at the time it was made, the making of that statement may constitute fraud. In this respect, the court drew an analogy with securities fraud, where it is generally held that a statement will be one "of belief" where it is shown that: "(1) that the statement is genuinely believed; (2) that there is [a] reasonable basis for that belief; and (3) that the speaker is not aware of any undisclosed facts tending to seriously undermine the accuracy of the statement."¹⁵⁰ Considering the statements made by Exxon representatives discussed above in light of the foregoing criteria, it seems unlikely that they would be considered opinions held in good faith, or "viewpoints." And on this point the court in *Philip Morris* couldn't have been clearer: "[T]he First Amendment does not shield fraud."¹⁵¹

There is one exception to this rule: statements made in the course of petitioning the government may warrant First Amendment protection under the Noerr-Pennington doctrine.¹⁵² Thus, while statements made when lobbying the government may merit Noerr-Pennington protection, and thus would not be actionable, "advocacy advertisements" made to the public would not.¹⁵³

(vi) "Pattern"

There must be a pattern of racketeering activity. "Pattern" is defined as two or more acts of racketeering activity committed within a 10-year period of each other.¹⁵⁴ This requirement relates to the scheme as a whole, as opposed to each of the discrete activities that form its component parts.¹⁵⁵ Though showing two acts is a prerequisite to finding a violation, that, on its own, may not be sufficient;¹⁵⁶ the acts must additionally be both "related" and "continuous."¹⁵⁷ Individual racketeering acts will be deemed "related" where they share a similar purpose, method of commission, results, participants, or are considered not isolated events.¹⁵⁸ "Continuity" is similarly flexible and may be established where the acts are a regular way of the defendant conducting his legitimate business, or of his conducting or participating in an ongoing RICO "enterprise."¹⁵⁹ Given the extent to which climate change denial was woven into the fossil fuel industry's business activities over the last four decades, if a scheme to defraud were to be shown, it is unlikely that "pattern" would prove a difficult element to show.

2. Section 1962(d): Conspiracy

RICO's conspiracy provision makes it an offense to conspire to violate any of RICO's substantive provisions under §§ 1962(a)-(c). Where it is shown that the defendants committed acts prohibited by RICO, there will be an inference that they had an agreement to do so.¹⁶⁰ On the flipside, courts are split on whether a plaintiff can bring a standalone conspiracy claim absent an actionable claim under §§ 1962(a)-(c).¹⁶¹ For these reasons, the focus of this article is on § 1962(c), and I will not address RICO's conspiracy action in great detail here.

The focus of a RICO conspiracy claim is on the agreement to participate in the conspiracy, rather than on the individual predicate acts.¹⁶² Thus, in addition to showing an enterprise and an effect on interstate commerce, the plaintiff must show that each defendant knowingly agreed to commit two predicate acts, or to participate in the conduct of the enterprise with the knowledge and intent that others would.¹⁶³ There is no requirement that an individual conspirator have committed a RICO violation.¹⁶⁴ A conspiracy may still be found where the membership fluctuates over time,¹⁶⁵ as would likely be the case in climate litigation, and a conspirator may be liable for acts committed by others prior to his membership.¹⁶⁶

Much of the discussion above relating to the establishment of a scheme to defraud is relevant here. For example, in *Philip Morris*, in finding a conspiracy the court again focused on the tobacco industries' agreement to form and fund front groups, and coordinate public relation campaigns, and marketing activity, in furtherance of their common purpose.¹⁶⁷ Given the analogous analysis, I will not address this again here.

C. Section 1964(c): Private Civil RICO

Section 1964(c) of RICO creates a private cause of action for any "person" who has suffered a compensable injury to recover treble damages.¹⁶⁸ Private civil RICO presents one major obstacle over government civil RICO, which may prove difficult to surmount in the climate change context. A private plaintiff must allege and prove that he has been "injured in his business or property by reason of the conduct constituting the relevant [RICO] violation."¹⁶⁹ This is essentially a "standing" requirement, and courts as a general rule limit standing to persons whose injuries were both factually and proximately caused by the alleged RICO violation;¹⁷⁰ in other words, there must be some direct relation between the injury asserted, which must be concrete economic loss,¹⁷¹ and the alleged conduct.¹⁷² Though reliance is not a requirement under private civil RICO,¹⁷³ in most fraud-based RICO cases "but-for" causation will prove hard to establish where the plaintiff cannot show reliance on the relevant misrepresentation.¹⁷⁴

Causation is often cited as one of the biggest hurdles to bringing a successful climate change damages claim.¹⁷⁵ And indeed, this is reflected in the record of climate change litigation to date. There are two cases worth mentioning in this respect. In *Native Village of Kivalina v. ExxonMobil Corp.*,¹⁷⁶ the plaintiffs alleged that the public had relied on the defendant companies' misrepresentations about climate change, those misrepresentations had induced the government into not regulating, and the public into continuing to burn, fossil fuels, the loss of the Arctic sea ice protecting the village from winter storms, and that the resulting erosion had threatened the habitability of the plaintiffs' village. The case was ultimately dismissed; the court finding that the plaintiff's claim [presented such a complex question of causation that it evaded judicially manageable standards of reaching a reasoned resolution and presented threshold political questions that would be better addressed by Congress. More specifically, the court found, given our long history of greenhouse gas emissions, "there is no realistic possibility of tracing any particular alleged effect of global warming to any particular emissions by any specific person and any group at any particular point and time."¹⁷⁷

In *Comer v. Murphy Oil*,¹⁷⁸ inhabitants of the Mississippi Gulf coast filed suit against various fossil fuel and energy companies, in the wake of the destruction caused by Hurricane Katrina. The plaintiffs alleged that the defendants had contributed to global warming through greenhouse gas emissions, which had resulted in the unprecedented force of Hurricane Katrina. The court held that the plaintiffs lacked standing as they could not show that their alleged injuries were "fairly traceable" to the defendants' activities. In particular, "[t]he assertion that the defendants' emissions combined over a period of decades or centuries with other natural and man-made gases to cause or strengthen a hurricane and damage personal property

is precisely the type of remote, improbable, and extraordinary occurrence that is excluded from liability.”¹⁷⁹

Though much depends on the specific injury being alleged, most anticipated impacts from climate change are likely to present a complex causal picture for two key reasons. First, many climate-related harms occur to a certain extent absent anthropogenic global warming, thus under rules of causation, plaintiffs would need to establish the degree to which anthropogenic emissions increased the risk that the alleged injury would occur. Second, the huge number of greenhouse gas emitters complicates causation further; what amount of emissions is “too small” to make a difference? These questions, among others, will present challenges for a private party looking to litigate climate change under private RICO, in much the same way as it did in *Kivalina* and *Comer*.

D. Would a Claim Be Better Brought at the State Level Under “Little RICO” Statutes?

1. New York’s Organized Crime Control Act

Though New York had struggled for some time with organized crime, state legislators were concerned that federal RICO went too far in its breadth.¹⁸⁰ As such, when it came to adopting New York’s RICO counterpart, the Organized Crime Control Act of 1986 (OCCA), New York legislators drafted the crime of “enterprise corruption” to apply to a narrower range of activities and persons than its federal counterpart. OCCA applies “to persons employed by or associated with criminal enterprises,” only to the extent that they participate “in a pattern of criminal activity.”¹⁸¹ OCCA was drafted with individuals in mind, not corporations. As such, the enterprise itself is not subject to prosecution.¹⁸²

OCCA was intended as a prosecutorial tool, and as such does not provide for a private cause of action. Furthermore, the government is limited to criminal remedies,¹⁸³ which are limited to imprisonment, forfeiture, and fines.¹⁸⁴ OCCA incorporates a broad range of offenses under New York law, including, relevantly, schemes to defraud¹⁸⁵ and false statements.¹⁸⁶ A conspiracy or an attempt to commit any felony will also constitute a criminal act under OCCA.

Two factors point to the conclusion that OCCA would not be a valuable tool to bring a claim against Big Oil. First, as it provides for a criminal cause of action only; it requires a higher burden of proof than civil RICO. Second, its focus on individuals, over corporations or associations of both, means that it would likely not be suited to the objectives of possible climate litigation, and its more limited scope means that greater protection is afforded to defendants than by its federal counterpart.

2. California’s Control of Profits and Organized Crime Act

The California Control of Profits and Organized Crime Act (CPOCA)¹⁸⁷ is unusual among “little RICO”

statutes in that it provides neither a criminal nor civil cause of action; the only remedy it offers is forfeiture of assets derived from unlawful activities.¹⁸⁸ CPOCA will be triggered when a person engages in a pattern of criminal profiteering activity¹⁸⁹ and is convicted of the underlying offense.¹⁹⁰ The definition of “criminal profiteering activity” and “organized crime” are much narrower than their federal counterparts.¹⁹¹ “Criminal profiteering activity” is defined by reference to certain enumerated acts. Though fraud does feature twice, the fraudulent acts relate specifically to welfare¹⁹² and insurance claims,¹⁹³ rather than to fraudulent activities more broadly. As such, CPOCA would likely not prove useful for possible climate litigation.

V. Even If Legally Feasible, Is a Government Civil RICO Action the Best Way to Hold Oil Companies Accountable?

A government civil RICO action offers a number of advantages over private civil RICO, California and New York “little RICO,” and criminal RICO actions. It also has an advantage over climate change tort litigation, discussed above in the context of private civil RICO. However, being preferable and feasible does not necessarily render a particular path a good one to take. That being so, this section of the article aims to synthesise the foregoing discussion, and consider some of the overall benefits of a government civil RICO claim, including whether such a claim would be successful in holding the fossil fuel industry to account.

A. ISSUE 1: Remedies

The *Philip Morris* litigation made it clear that relief available to the federal government under § 1964(a) is limited to forward-looking remedies that prevent and restrain—not those that “prevent, restrain and discourage”—future violations of RICO.¹⁹⁴ Remedies aimed at punishing or correcting the effects of past conduct are not available.¹⁹⁵ This then begs the question: what forward-looking remedies would be effective in holding the fossil fuel industry to account? Several of the remedies ordered in the tobacco litigation seem relevant. For example, one could imagine corrective statements about the adverse effects of fossil fuel combustion, enjoining the fossil fuel industry from making any false or misleading public statement about climate change, and enabling public access to industry documents being viable.

However, it is not clear that the corrective statements or misleading statements remedies would be appropriate in climate change litigation. When ordering the remedy in *Philip Morris*, the court noted that, despite “steps forward,” the defendants’ public statements “[continued] to omit material information or present information in a misleading and incomplete fashion.”¹⁹⁶ However, Exxon, for example, has changed its tune over the last few years. Its website contains a clear acknowledgment of climate change,¹⁹⁷ and, in a letter to the White House last month,

Exxon urged President Trump to stick with the Paris Agreement, heralding the agreement as “an effective framework for addressing the risks of climate change.”¹⁹⁸ Whether this change of tack be political maneuvering or not,¹⁹⁹ in these two examples, at least, there is limited evidence of continuing fraud.

The third remedy pertaining to document disclosure is more promising. The defendants in *Philip Morris* were ordered to create and maintain document depositories and websites containing a wealth of internal documents.²⁰⁰ Doing so, the court held, would allow the public to monitor what the defendants were doing internally and assess the accuracy of future information about their products and operations.²⁰¹ Such a remedy could be a similarly “powerful restraint” on the fossil fuel industry. Moreover, the value of document disclosure and transparency doesn’t begin with the remedy. A key lesson to be gleaned from the tobacco litigation is that the litigation process forced the tobacco industry to reveal its internal corporate strategies.²⁰² Internal documents proved central to “[shifting] the focus of litigation away from a battle of the experts over the science of disease causation and toward an investigation of the industry’s conduct.”²⁰³ In this respect, RICO’s civil investigative demand (CID) provision would allow the government to compel document production prior to commencing an investigation.²⁰⁴

B. ISSUE 2: Impact

Last year marked the 50th anniversary of the U.S. Surgeon General’s report linking smoking with disease, and over a decade since *Philip Morris*. Yet the struggle for tobacco control continues to this day. Over 35 million Americans smoke, more than 16 million live with smoking-related disease, and smoking remains the number one cause of preventable death in the U.S., with around 480,000 people dying prematurely from smoking each year.²⁰⁵ Did the tobacco litigation achieve anything? What are the implications for climate change litigation? If people continue to smoke in the knowledge that it kills, will they continue to use fossil fuels in full knowledge of the resultant environmental and human costs? Both issues suffer from a tragedy of the horizon of sorts; harm from smoking is generally not felt until later in life, and, for the majority of people, the effects of climate change are more likely to be felt by children and grandchildren.

Though the smoking statistics are dispiriting, progress has been made. When the Surgeon General issued his report in 1953, 45 percent of the population smoked; today this figure stands at 15 percent.²⁰⁶ Further, in the wake of *Philip Morris*, President Obama signed into law legislation bringing tobacco under the remit of the Food and Drug Administration (FDA). Up to then, the FDA lacked jurisdiction due to a Supreme Court decision holding that the regulation of tobacco required express legislative approval; appetite for which was until that point absent.²⁰⁷ Moreover, dealing with climate change denial before the judicial, as opposed to political, branches of

government may prove more impactful given judges’ role as arbiters of fact and fiction, and courtroom rules relating to evidence and expert testimony.²⁰⁸ These factors leave the courts well placed to depoliticize the climate change issue, at least to some degree. A decision in favor of the government under RICO would furthermore put additional pressure on the political branches of government to take action, and may cause individuals to change their mind on the climate change issue.²⁰⁹ Government civil RICO seems to offer a promising way to get the climate change issue before the courts, circumventing some of the tricky causation issues that have so far caused courts to consider climate change a political matter.²¹⁰

C. ISSUE 3: Politics

The government, with all its predilections and preferences, is transitory, and therefore relevant only to the extent of its tenure. However, it is relevant nonetheless, and, under the current administration, there is likely to be little appetite to bring the type of claim envisaged in this article.

The inclinations of the current government notwithstanding, two advantages afforded to the U.S. government when it appears as plaintiff include an exemption from the defense of laches, and, where there is no applicable limitation provision in the relevant federal statute, no time limitation on the bringing of the relevant cause of action. RICO itself does not contain any time limitation. Consequently, and in accordance with RICO’s legislative history,²¹¹ courts have repeatedly held that the government is not bound by a statute of limitations when it brings suit in its sovereign capacity to protect the public interest.²¹² Thus, it appears that RICO remains available for use by an interested government further down the line.

VI. Conclusion

RICO was enacted in response to activity that weakened the U.S. economy, harmed investors and competing businesses, undercut competition, and undermined citizens’ welfare.²¹³ Through its campaign of deceit, the fossil fuel industry obstructed national and international regulation, and prolonged consumption of, and reliance on, a product, the burning of which is the foremost contributor to climate change. Today, we face changes to our planet that threaten the welfare of economies and peoples around the world. Though, for some, the leap from the Mafia, to tobacco, to fossil fuel, may seem like a stretch, the conduct identified by ICN and the *LA Times*, and its impact, fits both the purpose and scheme of RICO. Though the issues are complex, the case is not. This is about an industry that marketed and sold its product “with zeal, with deception, with a single-minded focus on [its] financial success, and without regard for the human tragedy or social costs that success exacted.”²¹⁴

Endnotes

1. Neela Banerjee et al., *Exxon: The Road Not Taken*, InsideClimate News, September 16, 2015, available at <https://insideclimatenews.org/content/Exxon-The-Road-Not-Taken>.
2. Sara Jerving et al., *What Exxon knew about the Earth's melting Arctic*, Los Angeles Times, October 9, 2015, available at <http://graphics.latimes.com/exxon-arctic/>.
3. Pub. L. No. 91-452, 84 Stat. 922 (1970) (Statement of Findings and Purpose).
4. Enacted as Title IX of the Organized Crime Control Act of 1970 and codified at 18 U.S.C. §§ 1961-1968.
5. S. Rep. No. 91-617 at 79, 80-81.
6. Organized Crime Control Act § 904(a), 84 Stat. at 947 (advising that RICO “be liberally construed to effectuate its remedial purposes”).
7. *Sedima, S.P.R.L. v. Imrex Co.*, 473 U.S. 479, 499 (1985) (noting that legitimate enterprises are neither incapable of criminal activity nor immune from its repercussions).
8. 18 U.S.C. § 1964.
9. 18 U.S.C. § 1963.
10. For a criminal claim, the plaintiff must satisfy the high “beyond a reasonable doubt” standard, whereas civil claims are governed by the “preponderance of the evidence” standard.
11. 18 U.S.C. § 1964(b).
12. 18 U.S.C. § 1964(c).
13. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d 1, 17 (D.D.C. 2006).
14. Brandt, Allan M., *Inventing Conflicts of Interest: A History of Tobacco Industry Tactics*, American Journal of Public Health, 63 (2012).
15. *Id.*, at 64.
16. See, e.g., Susan E. Kearns, Note, *Decertification of State-wide Tobacco Class Actions*, 74 N.Y.U. L. Rev. 1336, 1338 (1999).
17. Robert L. Rabin, *A Sociolegal History of the Tobacco Tort Litigation*, 44 STAN. L. REV. 853, 868 (1992); see also STANTON GLANTZ ET AL., THE CIGARETTE PAPERS xvii, 53 (1996).
18. Tucker S. Player, *After the Fall: The Cigarette Papers, the Global Settlement, and the Future of Tobacco Litigation*, 49 S.C. L. REV. 311, 317 (1998).
19. *Id.*
20. Rabin, *supra* note 17, at 874.
21. Standing presented the main obstacle for hospital and health fund plaintiffs. In the case of health funds, see *Laborers Local 17 Health and Benefit Fund v. Philip Morris, Inc.*, 191 F.3d 229, 240 (2d Cir. 1999) (where the court found that the health fund plaintiff was unable to demonstrate that their economic injury was proximately caused by the defendants’ alleged conspiracy to mislead the public regarding the health risks of smoking). For hospitals, see *Allegheny Gen. Hosp. v. Philip Morris, Inc.*, 228 E3d 429, 444-45 (3d Cir. 2000) (the court found against standing for hospitals because “[w]hen an injury is indirect, remote, and many steps away from the alleged cause it is unadvisable to allow a case to proceed”); and *Ass’n of Wash. Pub. Hosp. Dist. v. Philip Morris, Inc.*, 241 F.3d 696, 701-02 (9th Cir. 2001) (finding that hospital districts lacked standing as the alleged injury was too remote).
22. This was the reasoning in the case of foreign governments bringing a claim under RICO. See, e.g., *Serv. Emps. Int’l Union Health & Welfare Fund v. Philip Morris, Inc.*, 249 F.3d 1068, 1072-73 (D.C. Cir. 2001). Another reason that foreign governments failed was due to the claim being held barred by the revenue rule, which holds that the courts of one sovereign will not enforce tax judgments or claims of another sovereign; see, e.g., *Att’y Gen. of Can. v. R.J. Reynolds Tobacco Holdings, Inc.*, 268 F.3d 103, 106-07 (2d Cir. 2001).
23. *Complaint for Damages and Injunctive and Declaratory Relief, United States v. Philip Morris USA, Inc.* (Sep. 22, 1999). The government’s lawsuit included four counts, two of which were brought under RICO. The RICO counts were considered controversial at the time as the lawsuit marked the first time that RICO had been used against an entire industry. See Barry Meier, *Two Strategies at Work and Stiff Challenges Ahead in Federal Lawsuit*, N.Y. Times, Sept. 23, 1999, at A22.
24. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d at 11.
25. *Complaint for Damages and Injunctive and Declaratory Relief, supra* note 23, at 49.
26. *Id.* at 21.
27. *Id.* at 36.
28. *Id.* at 47.
29. *Id.* at 23.
30. *United States v. Philip Morris*, 449 F. Supp. 2d.
31. *United States v. Philip Morris*, 449 F. Supp. 2d at 27 (holding that “[T]he Government has established that Defendants (1) have conspired together to violate the substantive provisions of RICO, pursuant to 18 U.S.C. § 1962(d) and (2) have in fact violated those provisions of the statute, pursuant to 18 U.S.C. § 1962(c)”).
32. *Id.* at 1630
33. *Id.* at 1635. The corrective statements were ordered to appear on company websites, cigarette packages, prime-time network television advertisements, and in newspaper advertisements.
34. *Id.* at 1636
35. *Id.* at 1644.
36. *Id.* at 1647.
37. *Id.* at 1623 (holding that the court did not have authority order disgorgement as it was limited to “such remedies as are designed to “prevent and restrain” Defendants from committing future RICO violations by separating them from the RICO enterprise”).
38. *Id.* at 1651.
39. Svante Arrhenius, *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground*, Philosophical Magazine and Journal of Science Series 5, Volume 41, 237-276 (1896).
40. *Id.*
41. National Academy of Sciences, Climate Research Board, *Carbon Dioxide and Climate: A Scientific Assessment* (1979) (finding it highly credible that a doubling of carbon dioxide will bring 1.5-4.5°C global warming).
42. SPENCER R. WEART, THE DISCOVERY OF GLOBAL WARMING (HARVARD UNIVERSITY PRESS, 2008), available at <http://history.aip.org/climate/public.htm>.
43. Neela Banerjee et al., *Exxon’s Own Research Confirmed Fossil Fuels’ Role in Global Warming Decades Ago*, Inside Climate News, Sept. 16, 2015, available at <https://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-role-in-global-warming> (quoting Exxon scientist James F. Black).
44. J. F. Black, *The Greenhouse Effect*, 2 (Jun. 6, 1978), available at <https://insideclimatenews.org/sites/default/files/documents/James%20Black%201977%20Presentation.pdf>.
45. Exxon, *C02 Greenhouse Effect: A Technical Review*, 4 (Apr. 1, 1982), available at <http://insideclimatenews.org/sites/default/files/documents/1982%20Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf>.
46. *Id.* at 5.
47. *Id.*
48. SPENCER R. WEART, THE DISCOVERY OF GLOBAL WARMING, (HARVARD UNIVERSITY PRESS, 2008), available at <http://history.aip.org/climate/pdf.htm>.
49. IPCC First Assessment Report, *Climate Change: The IPCC Scientific Assessment*, xi (Cambridge, Cambridge University Press Online

- 1990) (noting that the Earth had been warming, and would likely continue to warm).
50. The IPCC's climate change barometer moving from "likely" in 1990 (*id.*), to "the balance of evidence suggests...a discernible human influence on global climate" by 1995 (see IPCC Second Assessment, *Climate Change 1995*, 5 (1995)) to "unequivocal" in 2007 (see IPCC Fourth Assessment Report, *Climate Change 2007: Synthesis Report*, 2 (Cambridge University Press, Cambridge, 2007) (noting that "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level").
 51. Edward W Maibach and Sander L van der Linden, *Consensus on consensus: a synthesis of consensus estimates on human-caused global warming*, Environmental Research Letters Vol. 11 No. 4 1, 6 (2016) (noting a scientific consensus range of between 90 percent and 100 percent).
 52. IPCC Fourth Assessment Report, *supra* note 50, at 17.
 53. *Sedima, S.P.R.L. v. Imrex Co., Inc.*, 473 U.S. 479, 496 (1985); *United States v. Philip Morris*, 449 F. Supp. 2d., at 1498.
 54. *United States v. Philip Morris*, 449 F. Supp. 2d., at 1621.
 55. 18 U.S.C. § 1961(4).
 56. *Greenberg v. Blake*, No. 09 Civ. 4347(BMC), 2010 WL 2400064 (E.D.N.Y. June 10, 2010).
 57. *Boyle v. United States*, 556 U.S. 938, 948 (2009).
 58. *Richmond v. Nationwide Cassel, L.P.*, 52 F.3d 640, 644 (7th Cir. 1995).
 59. *United States v. Philip Morris*, 449 F. Supp. 2d., at 1528.
 60. The tobacco industry formed the Tobacco Industry Research Committee, which was succeeded by the Council for Tobacco Research. The fossil fuel industry similarly formed the Global Climate Coalition.
 61. *Boyle v. United States*, 556 U.S. 938, 939 (2009).
 62. The *Philip Morris* court used the test laid down in *United States v. Bledsoe*, 674 F.2d 647 (8th Cir. 1982), which required (1) a common purpose, (2) organization, and (3) continuity.
 63. See, e.g., *United States v. Owens*, 167 F.3d 739, 751 (1st Cir. 1999) (individual members of the enterprise provided other members with financial support and coordinated transportation of drugs); *United States v. Perholtz*, 842 F.2d 343, 355 (D.C. Cir. 1988) (noting that "The interlocking nature of the schemes and the overlapping nature of the wrongdoing provides sufficient evidence for the jury to conclude that this was a single enterprise"); *United States v. Davidson*, 122 F.3d 531, 535 (8th Cir. 1997) (noting that "The length of these associations, the number and variety of crimes the group jointly committed, and Davidson's financial support of his underlings demonstrates an ongoing association with a common purpose...rather than a series of ad hoc relationships"); *United States v. Qaoud*, 777 F.2d 1105, 1116-17 (6th Cir. 1985) (the court held that the existence of the alleged association-in-fact enterprise could be inferred from the "coordinated nature of the defendants' activity" and that the defendants' racketeering acts were facilitated by their nexus to the enterprise").
 64. *United States v. Philip Morris USA, Inc.*, 449 F. Supp., at 1530.
 65. *Id.* at 1531.
 66. Whose members included representatives from nearly every major U.S. and international fossil fuel company, including Amoco, Exxon, Phillips, Shell, Sunoco, Sohio, Texaco, and Chevron (then Standard Oil of California and Gulf Oil).
 67. American Petroleum Institute, *Global Climate Science Communications Plan*, 2 (1998), available at <https://insideclimatenews.org/documents/global-climate-science-communications-plan-1998>.
 68. A. Revkin, *Industry Ignored Its Scientists on Climate*, N.Y. Times, April 23, 2009, available at <http://www.nytimes.com/2009/04/24/science/earth/24deny.html>.
 69. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1532.
 70. *Id.* at 1532.
 71. *Id.* at 1534.
 72. *Boyle v. United States*, 556 U.S. at 948.
 73. *Id.* at 948
 74. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1535.
 75. *United States v. Robertson*, 514 U.S. 669, 672 (1995).
 76. *DeFalco v. Bernas*, 244 F.3d 286, 309 (2d Cir. 2001); *Bunker Ramo Corp. v. United Bus. Forms, Inc.*, 713 F.2d 1272, 1289 (7th Cir. 1983).
 77. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1538.
 78. Statista, *Oil and gas industry revenue in the United States from 2010 to 2015*, available at <https://www.statista.com/statistics/294614/revenue-of-the-gas-and-oil-industry-in-the-us/>.
 79. See, e.g., *Crichton v. Golden Rule Ins. Co.*, 576 F.3d 392, 399 (7th Cir. 2009) (noting that "[RICO] does not penalize tangential involvement in an enterprise").
 80. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1543.
 81. *Id.*
 82. *United States v. Rastelli*, 870 F.2d 822, 828 (2d Cir. 1989).
 83. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1545
 84. *Id.* at 1547.
 85. *Id.* at 1502; *Pereira v. United States*, 347 U.S. 1, 8-9 (1954); *Schmuck v. United States*, 489 U.S. 705, 721 n. 10 (1989).
 86. *United States ex rel. O'Donnell v. Countrywide Home Loans, Inc.*, 822 F.3d 650, 662 (2d Cir. 2016) (finding that "Unlike fraud at common law, the federal statutes require neither reliance by nor injury to the alleged victim"); *Neder v. United States*, 527 U.S. 1, 4, 119 S. Ct. 1827, 1831 (1999) (noting that "[t]he common-law fraud requirements of 'justifiable reliance' and 'damages' have no place in the federal criminal statutes proscribing mail fraud...[and] wire fraud...as...these statutes prohibit a scheme to defraud, rather than the completed fraud"); *United States v. Merklinger*, 16 F.3d 670, 678 (6th Cir. 1994) (where the court observed that that "reliance is not an element of mail or wire fraud"); *United States v. Maxwell*, 920 F.2d 1028, 1036 (D.C. Cir. 1990) (noting that a fraudulent scheme may exist even when "no reasonable [prudent] person would have believed [the defendant's] misrepresentations...[or] where [people] unreasonably believed the representations made to them"); *United States v. Brien*, 617 F.2d 299, 311 (1st Cir.1980) (holding that "'it makes no difference whether the persons the scheme is intended to defraud are gullible or sceptical, dull or bright...The only issue is, whether there is a plan, scheme or artifice intended to defraud").
 87. *United States v. D'Amato*, 39 F.3d 1249, 1257 (2d Cir. 1994) (in which the court held that "Where the scheme does not cause injury to the alleged victim as its necessary result, the government must produce evidence independent of the alleged scheme to show the defendant's fraudulent intent).
 88. *United States v. Helmsley*, 941 F.2d 71, 94 (2d Cir. 1991).
 89. *United States v. Reid*, 533 F.2d 1255, 1264 (D.C. Cir. 1976) (observing that "Proof that someone was actually defrauded is unnecessary simply because the critical element in a 'scheme to defraud' is 'fraudulent intent'").
 90. *D'Amato*, 39 F.3d at 1256-57; *United States v. Regent Office Supply Co.*, 421 F.2d 1174, 1180-81 (2d Cir. 1970). Section 1964(c) RICO does require proof of injury where the plaintiff is a private individual, however there is no similar requirement for the federal government as a plaintiff.
 91. *United States v. Philip Morris USA Inc.*, 396 F.3d 1190, 1198 (D.C.C. 2004).
 92. Jed S. Rakoff and Howard W. Goldstein, *RICO: Civil and Criminal Law and Strategy*, 2.13 (Law Journal Press 2017).

93. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1507.
94. *Id.* at 1511.
95. *Id.* at 1506. See also Findings of Fact Section V(B)(3).
96. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at Opinion.
97. Cambridge Learner's Dictionary 1st ed. Cambridge, UK: Cambridge University Press, 2007.
98. IPCC Second Assessment, *supra* note 50, at 39.
99. Global Climate Coalition, *Primer on Climate Change Science*, 3 (January 18, 1996) (warning that "[T]he scientific basis for the Greenhouse Effect and the potential impact of human emissions of greenhouse gases such as CO₂ on climate is well established and cannot be denied"), available at http://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-7_GCC-Climate-Primer.pdf.
100. IPCC Second Assessment, *supra* note 50, at 39 (noting that "the balance of evidence suggests that there is a discernible human influence on global climate").
101. Exxon, *Global climate change: Everyone's debate* (1999), available at http://www.exxon.com/exxoncorp/news/publications/global_climate_change/globe3.html.
102. *Id.* at 5.
103. IPCC First Assessment Report, *supra* note 50.
104. National Oceanic and Atmospheric Administration, *The Climate of 1997 Global Temperature Index: 1997 Warmest Year of Century* (1997), available at <https://www.ncdc.noaa.gov/oa/climate/research/1997/climate97.html>. See also NASA's Goddard Institute for Space Studies, *Global Land-Ocean Temperature Index* (1880–2016), available at <https://climate.nasa.gov/vital-signs/global-temperature/>.
105. Exxon's Lee Raymond Speech at World Petroleum Congress, *Energy—key to growth and a better environment for Asia-Pacific nations*, 9 (October 13, 1997), available at <https://www.documentcloud.org/documents/2840902-1997-Lee-Raymond-Speech-at-China-World-Petroleum.html>.
106. GCC, *Primer on Climate Change Science*, *supra* note 99, at 15.
107. National Oceanic and Atmospheric Administration, *supra* note 104; IPCC Second Assessment Report, *supra* note 50, at 4 (noting that "[t]he mean global surface temperature has increased by about 0.3° to 0.6°C since the late 19th century, and by about 0.2° to 0.3°C over the last 40 years").
108. See, e.g., *Emery v. Am. Gen. Fin., Inc.*, 71 F.3d 1343, 1348 (7th Cir. 1995) ("A half-truth, or what is usually the same thing a misleading omission, is actionable as fraud, including mail fraud if the mails are used to further it, if it is intended to induce a false belief and resulting action to the advantage of the misleader and the disadvantage of the misled"); *United States v. Townley*, 665 F.2d 579, 585 (5th Cir. 1982) (holding that misleading newspaper ads and letters which were mailed "need not be false or fraudulent on their face, and the accused need not misrepresent any fact" since "it is just as unlawful to speak 'half-truths' or to omit to state facts necessary to make the statements made, in light of the circumstances under which they were made, not misleading").
109. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d at 1507.
110. Exxon, *The Greenhouse Effect*, 2 (1988), available at <http://www.climatefiles.com/exxonmobil/566/>.
111. API, *supra* note 67. The group that drew up the plan included representatives from Exxon, Chevron, and other representatives from several front groups and think tanks that have a history of campaigning against climate science, all of whom have received funding from Exxon and other companies within the fossil fuel industry.
112. *Id.* at 2.
113. *Id.* at 5.
114. *Id.* at 4.
115. *Id.* at 7.
116. *Neder v. United States*, 527 US 1 (1999).
117. *Kungys v. United States*, 485 U.S. 759, 770 (1988); *United States v. Lueben*, 838 F.2d 751, 754 (5th Cir. 1988); *United States v. Allen*, 892 F.2d 66, 67 (10th Cir. 1989).
118. *United States v. Philip Morris USA, Inc.*, 566 F.3d 1095, 1122 (D.C.C. 2009) (quoting *United States v. Weinstock*, 231 F.2d 699, 701 (D.C. Cir. 1956) (noting that (holding that the materiality requirement will met if the issue is "of importance to a reasonable person in making a decision about a particular matter or transaction").
119. Restatement (Second) of Torts, § 538(2)(a)-(b) (1977).
120. United States Department of State, Briefing Memorandum, June 20, 2011, available at <http://insideclimatenews.org/sites/default/files/documents/Global%20Climate%20Coalition%20Meeting%20%282001%29.pdf>.
121. Justin Farrell, *Corporate funding and ideological polarization about climate change*, Proceedings of the National Academy of Science, 92–97, January 5, 2016, vol. 113, no. 1, available at <http://www.pnas.org/content/113/1/92.abstract>.
122. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1584.
123. *Id.*
124. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1586.
125. *Id.* The court queried "why Defendants were spending millions upon millions of dollars in advertising every year if they thought no one—smoker, potential smoker, or member of the public—was going to believe it and rely on it."
126. *Pereira*, 347 U.S. at 8 ("It is not necessary that the scheme contemplate the use of the mails as an essential element"); *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d at 1550 (D.D.C. 2006) (quoting *United States v. Reid*, 533 F.2d 1255 (D.C. Cir. 1976), *aff'd*, 566 F.3d 1095 (D.C. Cir. 2009) ("it is not necessary that the individual mailing relied upon by the prosecution be shown to be in any way false or inaccurate, if the matter mailed is utilized in furtherance of or pursuant to the scheme to defraud").
127. *United States v. Mann*, 884 F.2d 532, 536 (10th Cir. 1984); *Pereira*, 347 U.S. at 8 (noting that "It is not necessary that the scheme contemplate the use of the mails as an essential element").
128. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1552.
129. *Id.* at 1555–57. Mobil made a number of "advocacy advertisements" which appeared in major newspapers around the world, though now unavailable through Exxon's website, are discussed in Ian H Rowlands, *Beauty and the beast? BP's and Exxon's positions on global climate change*, Environment and Planning C: Government and Policy, Vol. 18, 339, 344 (2009).
130. *Pereira v. United States*, 347 U.S. at 8–9.
131. *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1559.
132. See, e.g., *United States v. Autuori*, 212 F.3d 105, 115 (2d Cir. 2000); *United States v. D'Amato*, at 332; *United States v. Porcelli*, 865 F.2d 1352, 1358 (2d Cir.), *cert denied*, 493 U.S. 810 (1989); *United States v. Philip Morris USA, Inc.*, 449 F. Supp. 2d, at 1570.
133. *United States v. Diggs*, 613 F.2d 988, 997 (D.C. Cir. 1979) (where the court noted that "proof of fraudulent intent is critical" for the establishment of an offence under the mail or wire fraud statute, as the plaintiff is required to show only a "'scheme to defraud,' rather than actual fraud").
134. *United States v. Porcelli*, 865 F.2d 1352, 1358 (2d Cir.) ("The specific intent required under the mail fraud statute is the intent to defraud...and not the intent to violate a statute").
135. *United States v. Hannigan*, 27 F.3d 890, 892 at n.1 (3d Cir. 1994) (where the court found that "The specific intent element may be found from a material misstatement of fact made with reckless disregard for the truth"); *United States v. Munoz*, 233 F.3d 1117, 1136 (9th Cir. 2000) (noting that "reckless indifference to the truth or falsity of a statement satisfies the specific intent requirement

- in a mail fraud case”); and *United States v. Bryant*, 655 F.3d 232 (3d Cir. 2011) (where the court found sufficient evidence of fraudulent intent in light of the defendant’s efforts to conceal the fraudulent scheme).
136. *United States v. D’Amato*, 39 F.3d 1249, 1257 (2d Cir. 1994) (when the “‘necessary result’ of the actor’s scheme is to injure others, fraudulent intent may be inferred from the scheme itself”).
 137. *United States v. William E. Sullivan*, 406 F.2d 180 (2d Cir. 1969) (noting that “The presence of a fraudulent intent...must instead be established by legitimate inferences from circumstantial evidence. These inferences are based on the common knowledge of the motives and intentions of men in like circumstances”).
 138. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1572.
 139. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1574–75.
 140. For example, the API’s Communication Plan, *supra* note 67.
 141. See, e.g., *United States v. Regan*, 937 F.2d 823, 827 (2d Cir. 1991); *United States v. Rochester*, 898 F.2d 971 (5th Cir. 1990); *United States v. Dunn*, 961 F.2d 648 (7th Cir. 1992).
 142. *Steiger v. United States*, 373 U.S. 133 (10th Cir. 1967) (noting that good faith defense “is a complete defense”); *Coleman v. United States*, 167 F.2d 837, 839 (5th Cir. 1948) (finding that intent is critical as good faith is a complete defense).
 143. Letter from Attorney General Luther Strange and others, June 15, 2016, available at <https://assets.documentcloud.org/documents/2862197/AG-Coalition-Resp-Letter-2016-06-15.pdf>.
 144. *Id.*
 145. *New York Times Co. v. Sullivan*, 376 U.S. 254 (1964).
 146. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1502.
 147. *Id.* at 1503.
 148. *Id.*
 149. *Id.*
 150. *Id.* at 1504.
 151. *Id.* at 1564.
 152. The Noerr-Pennington doctrine has its roots in two Supreme Court decisions decided the 1960s, relating to antitrust litigation, in which the Court recognized a defence to a suit under antitrust laws, based on the First Amendment right to petition the government. *Id.* at 1562.
 153. *Id.* at 1563 (quoting *Eastern Railroad Presidents Conference v. Noerr Motor Freight, Inc.*, 365 U.S. 127, 136 (“racketeering acts comprising press releases or advertisements do not constitute efforts to persuade the legislature”).
 154. 18 U.S.C. § 1961(5).
 155. *United States v. Philip Morris*, 449 F. Supp. 2d at 1566.
 156. *H.J., Inc. v. Nw. Bell Tel. Co.*, 492 U.S. 229, 238 (1989) (the court found that though § 1961(5) suggests that Congress imagined circumstances where two acts would be enough to form a pattern, in certain circumstances two acts may not be enough).
 157. *Id.*, at 240.
 158. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1568.
 159. *Id.* at 1569 (quoting *H.J. Inc.*, 492 U.S. at 240–43).
 160. *United States v. Elliott*, 571 F.2d 880, 903 (5th Cir. 1978); *United States v. Ashman*, 979 F.2d 469, 492 (7th Cir. 1992);
 161. For examples of cases where a standalone conspiracy claim was deemed permissible, see *United States v. Browne*, 505 F.3d 1229, 1264 (11th Cir. 2007) (recognizing that a defendant can be guilty of conspiracy even if he did not commit the substantive acts that would constitute violations of Sections 1962(a), (b), or (c)); *In re Motel 6 Securities Litigation*, 161 F. Supp. 2d 227, 237 (S.D.N.Y. 2001) (“It is not necessary that plaintiffs allege a substantive RICO violation in order to prove liability for conspiracy”). However, for an opposing view, see *Efron v. Embassy Suites (Puerto Rico), Inc.*, 223 F.3d 12, 21 (1st Cir. 2000) (ruling that if pleadings do not state a substantive RICO claim, then the conspiracy claim will fail); *Tal v. Hogan*, 453 F.3d 1244, 1270 (10th Cir. 2006) (“If a plaintiff has no viable claim under § 1962(a), (b) or (c), then its subsection (d) conspiracy claim fails as a matter of law”).
 162. *United States v. Starrett*, 55 F.3d 1525, 1544 (11th Cir. 1995).
 163. *United States v. Nguyen*, 255 F.3d 1335, 1341 (11th Cir. 2001)
 164. *Salinas v. United States*, 522 U.S. 52, 63 (1997); *CGC Holding Co., LLC v. Broad and Cassel*, 773 F.3d 1076, 1088 (10th Cir. 2014) (one conspires to violate RICO by adopting the goal of furthering the enterprise, “even if the conspirator does not commit a predicate act”); *United States v. Godwin*, 765 F.3d 1306, 1324 (11th Cir. 2014) (when the government seeks to bring an action for conspiracy under RICO, it does not need to prove that each conspirator knew of his fellow conspirators, agreed with his fellow conspirators, had knowledge of all of the details of the conspiracy, or contemplated participating in the same related crime”).
 165. See, e.g., *United States v. Garcia*, 785 F.2d 214, 225 (8th Cir. 1986) (“An agreement may include the performance of many transactions, and new parties may join or old parties terminate their relationship with the conspiracy at any time.”); *United States v. Kelley*, 849 F.2d 999, 1003 (6th Cir. 1988) (single conspiracy can be found even where “the cast of characters changed over the course of the enterprise”
 166. *Salinas v. United States*, 522 U.S. 52, 63–64 (1997)
 167. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1593.
 168. 18 U.S.C. § 1964(c).
 169. *Id.*
 170. See, e.g., *Hecht v. Commerce Clearing House, Inc.*, 897 F.2d 21, 23 (2d Cir. 1990) (factual causation alone is not sufficient); *Brandenburg v. Seidel*, 859 F.2d 1179, 1189 (4th Cir. 1988) (rejecting RICO claim where plaintiff established factual cause but failed to establish proximate cause).
 171. See, e.g., *In re Bridgestone/Firestone, Inc. Tires Prods. Liab. Litig.*, 155 F. Supp. 2d 1069, 1090 (S.D. Ind. 2001).
 172. *Holmes v. Securities Investor Protection Corporation*, 503 U.S. 258, 271 (1992); *Steamfitters Local Union No. 420 Welfare Fund v. Philip Morris, Inc.*, 171 F.3d 912, 932–33 (3d Cir. 1999) (concluding that health fund plaintiffs lacked standing to sue tobacco companies for the costs associated with treating smoking-related illnesses as the chain of causation between the harmful effects of smoking and the actions of the tobacco companies’ actions was “too speculative and attenuated”).
 173. *Bridge v. Phoenix Bond & Indemnity Co.*, 553 U.S. 639, 661 (2008) (holding that “nothing on the statute’s face imposes [a requirement of reliance]” and that a person may be found liable under RICO “even if no one relied on any misrepresentation”).
 174. *Id.* at 659 (2008) (noting that “the complete absence of reliance may prevent the plaintiff from establishing proximate cause”).
 175. For a discussion of the reasons why causation presents such a challenge in the climate change context, see Michael B. Gerrard, *What Litigation of a Climate Nuisance Suit Might Look Like*, 121 YALE L.J. 135, 139 (2011). See also Andrew Gage and Margaretha Wewerinke, *Taking Climate Justice into Our Own Hands: A Model Climate Compensation Act*, West Coast Environmental Law and the Vanuatu Environmental Law Association, 31 (December, 2015), available at <http://wcel.org/resources/publication/taking-climate-justice-our-own-hands>.
 176. *Native Village of Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863 (N.D. Cal. 2008).
 177. *Id.* at 20.
 178. *Comer v. Murphy Oil*, 2007 WL 6942285 (S.D. Miss. 2007), rev’d, 585 F.3d 855 (5th Cir. 2009), *vacated on reh’g en banc*, 607 F.3d 1049 (2010).

179. *Comer v. Murphy Oil USA, Inc.*, 839 F. Supp. 2d 849 1, 35 (S.D. Miss. 2012).
180. See, e.g., Letter from Melvin H. Miller, Chairman, N.Y. State Assembly Comm. on Codes, to Evan A. Davis, Counsel to the Governor 2-3 (July 16, 1986).
181. N.Y. PENAL LAW §§ 460.20(1) and 460.20(1)(a).
182. N.Y. PENAL LAW §§ 460.00 and 460.20.
183. Though civil remedies may be sought incidentally to forfeiture proceedings, they are not set out under OCCA, and are not available in the absence of a criminal conviction.
184. N.Y. PENAL LAW § 460.30(5).
185. N.Y. PENAL LAW §§ 460.10(1)(a) and 190.65.
186. N.Y. PENAL LAW §§ 460.10(1)(a), 175.10, 175.25, 175.35, 175.40 and 210.40.
187. Cal. Penal Code §§ 186-186.8.
188. Cal. Penal Code § 186.3.
189. Cal. Penal Code § 186.2.
190. AMERICAN BAR ASSOCIATION, RICO: THE ULTIMATE WEAPON IN BUSINESS AND COMMERCIAL LITIGATION, Volume 1, Tab G-1, 16 (1983).
191. The relevant counterparts being “racketeering” and “enterprise,” respectively. See Cal. Penal Code § 186.2.
192. Cal. Penal Code § 186.2(21) and California Welfare and Institutions Code §14107.
193. Cal. Penal Code §§ 186.2(20) and 550.
194. *United States v. Philip Morris USA, Inc.*, 396 F.3d 1190, 1200 (D.C. Cir. 2005) (noting that “if general deterrence were a permissible objective, ‘the phrase ‘prevent and restrain’ would read ‘prevent, restrain, and discourage,’ and would allow any remedy that inflicts pain”).
195. *Id.* at 11.
196. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1631.
197. Exxon’s statement on climate change begins: “The risk of climate change is clear and the risk warrants action. Increasing carbon emissions in the atmosphere are having a warming effect”, available at <http://cdn.exxonmobil.com/~media/global/files/worldwide-giving/2015-worldwide-contributions-public-policy.pdf>.
198. Exxon, Letter to White House, March 22, 2017, available at http://www.huffingtonpost.com/entry/exxon-mobil-trump-administration-paris-climate-accord_us_58dc412ae4b05eae031d0199.
199. Exxon continues to fund organizations that perpetuate climate change denial. See Exxon, *Worldwide Contributions for Public Information and Policy Research* (2015), available at <http://corporate.exxonmobil.com/en/community/worldwide-giving/worldwide-giving-report/public-policy-research>.
200. *United States v. Philip Morris*, 449 F. Supp. 2d, at 1636.
201. *Id.* at 1637.
202. ALLAN BRANDT, *THE CIGARETTE CENTURY: THE RISE, FALL, AND DEADLY PERSISTENCE OF THE PRODUCT THAT DEFINED AMERICA*, 11 (Basic Books, New York 2009).
203. Union of Concerned Scientists and Climate Accountability Institute, *Establishing Accountability for Climate Change Damages: Lessons from Tobacco Control*, 8 (2012).
204. 18 U.S.C. §1968. Under RICO’s civil investigative demand process, the Attorney General may order the production of documentary evidence prior to the initiation of a civil or criminal investigation where there is “reason to believe” that any person or enterprise may have “documents” relevant to a racketeering investigation.
205. Centers for Disease Control and Prevention, *Current Cigarette Smoking Among Adults in the United States*, available at https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/.
206. *Id.*
207. *FDA v. Brown & Williamson Tobacco Corp., et al.* No. 98-1152, 529 U.S. 120 (2000).
208. Courtroom procedures may be contrasted with the rules for congressional hearings, which are generally much less formal. See, e.g., Valerie Heitshusen, Congressional Research Service, *Senate Committee Hearings: Arranging Witnesses* (March 12, 2015).
209. For an interesting discussion of what causes people to change their minds on the climate change issue, see Karin Kirk, *Changing minds on a changing climate*, Yale Climate Connections (April 4, 2017), available at <https://www.yaleclimateconnections.org/2017/04/changing-minds-on-a-changing-climate/> (most relevantly for this article, two of the most influential factors include learning about the science behind climate change and the fact that climate change deniers appear untrustworthy. A judgment in favor of the government would only enhance the impact of these factors).
210. See, e.g., *Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863, 876 (N.D. Cal. 2008) (where the court found that the plaintiff’s claim presented such a complex question of causation that it evaded judicially manageable standards and presented political questions better addressed by Congress).
211. U.S. Congress, Senate Committee on the Judiciary, *Organized Crime Control Act of 1969*, report to accompany S. 30, 91st Congress, 1st Session, December 16, 1969, Senate Report 91-617, 160 (“there is no general statute of limitations applicable to civil suits brought by the United States to enforce public policy, nor is the doctrine of laches applicable”). Further, RICO’s legislative history suggests that it was Congress’ intent that such a limitation should not be included. Both the House and Senate had the opportunity to include, and discussed including, a statute of limitations. However, no proposal ended up forming part of the bill or the statute. See, e.g., 116 CONG. REC. 35, 346 (1970) (Representative Steiger’s proposed amendment); 116 CONG. REC. 31,914 (1970) (Representative Poff proposed a five-year statute of limitations); and 118 CONG. REC. 29,615 (1972) (Senators McClellan and Hruska proposed an amendment including a statute of limitations, however this was never considered by the House).
212. *United States v. Philip Morris Inc.*, 300 F. Supp. 2d 61, 72–74 (D.D.C. 2004); *United States v. Private Sanitation Indus. Ass’n of Nassau/Suffolk, Inc.*, 793 F. Supp. 1114, 1152 (E.D.N.Y.1992); *United States v. International Bhd. of Teamsters*, 708 F. Supp. 1388, 1402 (S.D.N.Y.1989); *United States v. Bonanno Organized Crime Family*, 683 F. Supp. 1411, 1458 (E.D.N.Y.1988). See also United States Department of Justice, *Civil RICO: A Manual for Federal Prosecutors*, 61-64 (October 2007).
213. See discussion at *supra* note 3.
214. *United States v. Philip Morris*, 449 F. Supp. 2d, at 4.

New York Federal Court Holds Consent Order Fails to Resolve CERCLA Liability, Allows Cost Recovery Action Under Section 107

By James Periconi and Jose Almanzar

Consent orders can be a useful tool to resolve liability under the federal Superfund Law (a/k/a CERCLA) (read our recent blog post on this very point). In a recent case filed in the Northern District of New York, plaintiffs, Cooper Crouse-Hinds (CCH) and Cooper Industries (CI), sought reimbursement of cleanup costs against the City of Syracuse and Onondaga County for those municipalities' involvement in dumping hazardous substances at two local landfills. *Cooper Crouse-Hinds, LLC v. City of Syracuse*, No. 16-CV-1201, 2018 U.S. Dist. LEXIS 22100 (N.D.N.Y. Feb. 12, 2018). Both the City of Syracuse and Onondaga County moved to dismiss the lawsuit, claiming that prior consent orders entered between CCH and CI with the New York State Department of Environmental Conservation (DEC) resolved plaintiffs' CERCLA liability years ago and, thus, they were time-barred from seeking reimbursement from the municipalities. The court disagreed.

First a bit of background on the case: from the 1960s through the 1970s, the City of Syracuse Department of Public Works was allowed to dump municipal, commercial, and industrial waste in the landfills owned by CCH and CI. Syracuse DPW often dumped hazardous materials, like PCBs dredged from the local stream and other contaminated materials, which resulted in the DEC classifying the landfills as a Class 2 Inactive Hazardous Waste Disposal Site under the State Superfund Program in 1985.

In 2004 and 2011, CI and CCH, respectively, entered into Consent Orders with DEC requiring them to ultimately clean up the site. The 2011 Consent Order provided that CCH would be released from liability to the state for any remedial or response activities undertaken by plaintiffs "[u]pon the Department's issuance of a Certificate of Completion." As a result, CI and CCH undertook extensive remediation measures, spending upwards of \$11.9 million to clean up the site and establish long-term monitoring over 30 years, estimated to cost an additional \$1.14 million. CI and CCH's main argument was that the municipal defendants should reimburse them for some or all of those costs because those municipalities disposed contaminated sediments at the landfills and were actually identified as "potentially responsible parties" (PRP) under CERCLA by the United States Environmental Protection Agency.

Understanding CERCLA Claims (Contribution vs. Recovery Claims)

Under CERCLA, a plaintiff may seek reimbursement of site cleanup costs under either Section 107(a) or Section 113(f), but not both. Each CERCLA right of action has its

own statutory trigger and has distinct remedies available to parties in different situations. If a PRP has been sued (by the government or a private party) under Sections 106 or 107, it may recover contributions from other PRPs pursuant to Section 113(f)(1). On the other hand, if a PRP has "resolved" its liability to the federal or state government in an administrative or judicially approved settlement, it may only recover contributions pursuant to Section 113(f)(3)(B). If neither of those two conditions is present, a PRP may only bring a cost recovery action under Section 107.

The difference is important because each CERCLA cost reimbursement action carries different statute of limitations periods: a contribution claim under Section 113 must be made within three years (of an administrative settlement or law suit under Section 106 or 107), while the limitations period for cost recovery claims under Section 107 is six years (from commencement of response activities).

Outcome of the Case

In this case, CI and CCH claimed that relief under Section 107 was applicable because they had not been sued under Sections 106 or 107, nor had they resolved their CERCLA liability in an administrative settlement with the government, and thus, the six-year statute of limitations applied. The municipal defendants, on the other hand, argued that CI and CCH could not sue them under Section 107 because the 2004 Consent Order "resolved CI's liability for the costs incurred in complying with that order, which constitutes a statutory trigger requiring CI to proceed under § 113(f)(3)(B), not § 107," and thus, the three-year statute of limitations was appropriate. Defendants gave the same reasoning to dismiss CCH's claim under Section 107.

The court, however, disagreed with the City of Syracuse and Onondaga County, noting that "a consent order with the federal or state government does not necessarily qualify as an 'administrative or judicially approved settlement' that would require a PRP to proceed under § 113(f)(3)(B)" if it does not *clearly* resolve CERCLA liability. According to the court, the 2004 Consent Order did not necessarily resolve CI's liability, because no language existed in the 2004 Consent Order specifying that CI's li-

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ability would be resolved. The court highlighted language from the 2004 Consent Order indicating that CI's liability would not be resolved, specifically "[n]othing contained in this Order shall be construed as barring, diminishing, adjudicating, or in any way affecting the Department's rights." As a result, the court determined that CI was allowed to seek contribution costs from Syracuse and Onondaga County under Section 107.

The court also reasoned that the 2011 Consent Order did not resolve CCH's liability because the release of liability was conditioned upon the DEC's issuance of a Certificate of Completion, which had not been issued. Siding again with plaintiffs, the court held that relief under Section 113(f)(1) was not triggered and, therefore, CCH could

proceed with a recovery claim against defendants under Section 107, which as noted above prescribes a six-year limitations period.

What is the takeaway from this case? Consent orders with the government can be useful in resolving liability under CERCLA. However, parties must be careful in how they draft such consent orders because the resolution of *all* CERCLA claims could trigger the availability (or unavailability) of future CERCLA relief under Sections 107 or 113(f), each carrying their own statute of limitations periods and consequences. In this case, the plaintiffs' attorneys were careful (or lucky!) in negotiating the consent orders in such a way that CERCLA Section 107 cost-recovery relief, with the six-year limitations period, was available to them.

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New TSCA Regulations, New TSCA Risks

By Laura Smith

At a time when federal regulations are being frozen, delayed, or repealed, Toxic Substance Control Act (TSCA) reform continues to march on. Last summer, the United States Environmental Protection Agency (EPA) fulfilled its one-year statutory obligation to promulgate regulations outlining prioritization procedures and TSCA inventory notification requirements. Short on its heels, though, came challenges from the Environmental Defense Fund (EDF) and other organizations, arguing that the final rules are inconsistent with TSCA's requirements and overly favor the chemical industry to the detriment of the public.¹

Should courts agree with EDF and set aside some or all of the new regulations, the uncertainty of when and how EPA will regulate chemicals will have a detrimental effect on chemical manufacturers, importers, and downstream users. Even if courts affirm the new regulations, there will still be additional challenges, risks, and potential liability associated with the amendments. First, the TSCA changes may negatively affect corporations that

United States; expand EPA's authority to order companies to test chemicals they manufacture or import; and establish when and how TSCA will pre-empt state regulations.

Regulation of Existing Chemicals

The 2016 TSCA Amendments introduced four (4) new ways by which EPA will regulate existing chemicals:

- **Manufacturers and importers must identify all chemicals in active commerce.** Manufacturers and importers must notify EPA by February 7, 2018 of each chemical substance in the TSCA Chemical Substance Inventory (the "TSCA Inventory") that the manufacturer/importer has manufactured, imported, or processed for a non-exempt commercial purpose from June 21, 2006 to June 21, 2016.² Any chemical substance on the TSCA Inventory for which EPA receives a notice will be designated an "Active Substance."³ Any chemical substance on the TSCA Inventory for which EPA does not receive a notice will be deemed an "Inactive Substance."⁴

"Even if courts affirm the new regulations, there will still be additional challenges, risks, and potential liability associated with the amendments."

manufacture, import, use, distribute, and/or dispose of chemicals, especially if those chemicals are found to present an unreasonable risk to health and the environment. Second, despite EDF's assertion that the rules overly favor corporations, TSCA's changes and the recent rules promulgated thereunder will still make it more burdensome and costly to get new chemicals approved for the U.S. market. Third, increased scrutiny may increase potential liability in the form of personal injury cases, impacts on remediation programs, and environmental justice issues. Last, as of the writing of this article, neither EPA nor the reviewing court has postponed the effective date of the regulations. Unless otherwise exempt, all manufacturers and importers were obligated to submit a Notice of Activity to EPA by February 7, 2018.

Background

The Frank R. Lautenberg Chemical Safety for the 21st Century Act (the "TSCA Amendments"), enacted in June 2016, was the first major TSCA overhaul since its enactment in 1976. The TSCA Amendments modify how existing chemicals are and will be evaluated; change USEPA's authority to test and review new chemicals before they can be manufactured, distributed, or imported into the

- **EPA must prioritize chemicals as high- or low-priority.** EPA must establish a risk-based screening process to designate which chemical substances are "high-priority" or "low-priority" for risk evaluations.⁵ "High-priority substances" are chemical substances that EPA concludes, without consideration of costs or other non-risk factors, may present an unreasonable risk of injury to health or the environment because of: (1) a potential hazard; and (2) a potential route of exposure under the conditions of use, including an unreasonable risk to a potentially exposed or susceptible subpopulation.⁶ "Low-priority substances" are chemical substances that EPA identifies, without consideration of costs or other non-risk factors, as not meeting the standard for "high-priority."⁷ This process is expected to be ongoing—once EPA finalizes a risk evaluation for a chemical substance, it must designate at least one new high-priority chemical substance to then work down the pipeline.⁸ As described in more detail below, USEPA promulgated regula-

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tions on July 20, 2017 to establish the process and criteria by which it will identify high- and low-priority chemicals.

- **EPA must undertake a risk evaluation for high-priority chemicals.** EPA was required to commence evaluations on ten (10) chemicals by the end of 2016,⁹ and must continue to conduct risk evaluations on at least twenty (20) high-priority and at least twenty (20) low-priority substances by the end of 2019.¹⁰ The risk evaluations cannot consider costs or other non-risk factors, and must include whether it presents an unreasonable risk to a potentially exposed or susceptible subpopulation EPA identifies as relevant.¹¹ As described in more detail below, EPA promulgated regulations on July 20, 2017 to establish a process for conducting risk evaluations to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment.
- **EPA must issue regulations regarding all evaluated chemicals.** Within two (2) years after publication of a chemical substance's final risk evaluation, EPA must publish a final rule regarding that chemical.¹² When regulating chemicals, EPA may consider costs and non-risk factors, such as the magnitude of the exposure to humans, the benefits of the chemical substances or mixtures used, and the reasonably ascertainable economic consequences of the rule.¹³

Regulation of New Chemicals

Prior to the 2016 TSCA Amendments, the statute only required chemical manufacturers and importers to provide a Pre-Manufacture Notice (PMN) to EPA at least ninety (90) days before they manufactured or imported a new chemical.¹⁴ The statute did not require PMNs to include health or environmental safety data.¹⁵ Unless EPA could determine within the ninety (90) day timeframe that the new chemical could present an unreasonable risk, EPA could not act to preclude that chemical. Not having enough information was not a sufficient basis for EPA to delay production.¹⁶

Under the TSCA Amendments, EPA now must review and approve new chemicals before they can be manufactured, imported, distributed, used for the first time, or used as a "significant new use."¹⁷ If EPA cannot make a determination in ninety (90) days, EPA will now return the fee (with some exceptions) but will still be required to make a determination.¹⁸ EPA will not "drop" review of a chemical.

Expanded Authority to Require Testing

The TSCA Amendments grant EPA broader authority to test chemicals. Prior to its 2016 passage, EPA could only require testing if it demonstrated that the chemical substance may present an unreasonable risk of injury

to health or the environment and there was insufficient information available.¹⁹ Under the TSCA Amendments, EPA can now require testing by rule, order, or consent agreement if it is needed to: (1) review a PMN or to perform a risk evaluation; (2) implement a requirement imposed in a rule, order, or consent agreement; (3) comply with a request of a federal implementing authority under another federal law; (4) determine whether a chemical substance intended for export presents an unreasonable risk; or (5) develop new information to prioritize a chemical substance.²⁰

Addressing Preemption Issues

No new state laws, rules, or other regulations may be passed prohibiting or restricting a high-priority chemical substance during EPA's risk evaluation of that substance.²¹ However, the TSCA Amendments specifically allow states to:

- Continue to enforce laws/regulations already in place;
- Require the development of information for chemical substances that are not the subject of a federal rule, order, or consent agreement;
- Prohibit or restrict any chemical that is not the subject of a federal risk evaluation or final action, even if that chemical was found to not present an unreasonable risk; and/or
- Require notification of a significant new use of a chemical substance for which EPA has not already required notification.²²

Higher Thresholds for Confidential Business Information

Other changes in the TSCA Amendments include changes to the way companies can claim information is confidential. Prior to the TSCA Amendments, companies had more leeway in what they could claim was confidential and EPA would have to keep that information confidential indefinitely.²³ Now, a company must demonstrate that it has: (1) taken reasonable measures to protect the information's confidentiality; (2) determined that the information need not be disclosed or otherwise provided to the public under any other federal law; (3) a reasonable basis to conclude that the information's disclosure is likely to cause substantial harm to the company's competitive position; and (4) a reasonable basis to believe that the information is not readily discoverable through reverse engineering.²⁴ Confidential information is now only protected for ten (10) years from the date the confidentiality claim is asserted unless the company requests and EPA approves an extension.²⁵

Expanded Authority to Charge Fees

The TSCA Amendments also changed the fee structure to establish a TSCA Service Fee Fund and to set fees that will, in the aggregate, provide a sustainable source

of funds to annually defray the cost of carrying TSCA (capped at \$25 million).²⁶

New Regulations and Current Litigation

EPA recently promulgated two sets of regulations regarding: (1) the Procedures for Prioritization of Chemicals and Procedures for Chemical Risk Evaluation; and (2) TSCA Inventory Notification Requirements.

Procedures for Prioritization of Chemicals and Chemical Risk Evaluation

EPA's two (2) final rules promulgated on July 20, 2017, established the agency's evaluation priorities and procedures. When selecting candidates for a high-priority designation, EPA will focus on chemical substances with the greatest hazard and exposure potential first, considering reasonably available information on the relative hazard and exposure of potential candidates.²⁷ Preference will be given to chemical substances listed in the 2014 update of the TSCA Work Plan for Chemical Assessments that: (1) have a persistence and bioaccumulation score of 3; and (2) are known human carcinogens and have high acute and chronic toxicity.²⁸

To begin prioritization, EPA must publish a notice in the Federal Register and allow the public ninety (90) days to submit information on the chemical substance.²⁹ After evaluating the chemical substance (without considering costs and other non-risk factors), EPA will designate it as either high-priority or low-priority and publish the designation in the Federal Register.³⁰ Designation of a chemical substance as "high-priority" immediately triggers a risk analysis evaluation.³¹ Interestingly, a high-priority designation is not considered a final agency action and therefore is not subject to judicial review.³²

EPA must complete a final risk analysis evaluation as soon as practicable, but in no event later than three (3) years after the analysis' commencement.³³ If EPA determines that a chemical substance presents an unreasonable risk of injury to health or the environment under one or more of the analyzed conditions of use, EPA must issue regulations prohibiting or limiting the chemical substance's manufacturing, processing, and/or distribution in commerce.³⁴

Six (6) petitions were filed in different circuit courts requesting the courts to review and vacate the July 20, 2017 rules because "changes have been made [to the final rule] that significantly weaken the proposed rules, in some cases in ways that are contrary to the new law."³⁵ Indeed, a review of the January 19, 2017 proposed rule authored under the Obama Administration and the July 20, 2017 final rules authored under the Trump Administration shows several changes, including:

- Companies are not required to submit, and EPA is not obligated to review, all circumstances in which a chemical substance is intended, known, or

reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of.³⁶

- Companies are not specifically required to provide previously conducted risk assessments they may have undertaken or otherwise possess.³⁷

The petitions challenging the procedures for prioritization of chemicals have been consolidated and are currently docketed in the Court of Appeals for the Ninth Circuit.³⁸ The petitions challenging the procedures for chemical risk evaluation have been consolidated and are docketed in the Court of Appeals for the Fourth Circuit.³⁹ As of the writing of this article, a briefing schedule has not been filed for the chemical risk evaluation challenge in the Fourth Circuit. The consolidated opening brief for the prioritization rule in the Court of Appeals for the Ninth Circuit is due January 23, 2018.⁴⁰

TSCA Inventory Notification (Active-Inactive) Requirements

To facilitate the designation of all chemicals on the TSCA Chemical Substances inventory as "active" or "inactive," EPA promulgated regulations on August 11, 2017, requiring the following recordkeeping and reporting:

- By February 7, 2018, all manufacturers and importers *must* submit a Notice of Activity—Form A for any substance on the TSCA Chemical Inventory manufactured for non-exempt purposes between June 21, 2006 and June 21, 2016.⁴¹
- By October 5, 2018, all processors (i.e., any person who prepares a chemical substance or mixture, after its manufacture, for distribution in commerce⁴²) *may* submit a Notice of Activity—Form A for any substance on the TSCA Chemical Inventory manufactured for non-exempt purposes between June 21, 2006 and June 21, 2016.⁴³
- A request to maintain an existing claim of confidentiality must be made when the information is submitted.⁴⁴
- Any person who intends to manufacture or process an inactive substance must notify EPA not more than ninety (90) days prior to the anticipated start of manufacturing.⁴⁵
- All documents must be submitted electronically.⁴⁶
- Companies must maintain records submitted to EPA for five (5) years.⁴⁷

There are several exceptions to the Notice of Activity reporting requirements, including but not limited to:

- Chemicals manufactured, imported, or processed solely in small quantities for research and development (i.e., quantities that are not greater than reasonably necessary for such purposes).⁴⁸

- Chemicals reported to EPA by another manufacturer, as evidenced by a Central Data Exchange receipt.⁴⁹
- The import or processing of a chemical substance as part of an article.⁵⁰
- The manufacturing or processing of substances that have no commercial use or by-products that's only commercial use is to burn it as fuel or dispose of it as a waste.⁵¹
- The manufacturing or processing of a chemical substance solely for test marketing purposes.⁵²
- The processing of a naturally occurring chemical substance only by manual, mechanical, or gravitational means; by dissolution in water; by flotation; or by heating solely to remove water.⁵³

It is important to note that if a manufacturer does not submit a Notice of Activity—Form A because it is relying on an exception, that manufacturer cannot maintain an existing claim of confidential business information (CBI).⁵⁴ Any chemical substance on the active list will be moved from the confidential portion to the public portion unless a new CBI request is received.⁵⁵

EDF filed a petition in the United States Court of Appeals for the District of Columbia Circuit on September 1, 2017, for judicial review of the August 11, 2017 regulations.⁵⁶ Like the Procedures for Prioritization of Chemicals and Chemical Risk Evaluation rules, EDF believes the final TSCA Inventory Notification rule overly favors the chemical industry to the public's detriment.⁵⁷ A review of the Obama Administration's January 13, 2017 proposed rule and the Trump Administration's August 11, 2017 final rule shows several changes, including:

- The final rule includes an exemption for chemical substances manufactured or processed solely for export or for test marking purposes from the notification requirements.⁵⁸
- More information was required in the Notice of Activity—Form A under the proposed rule. Under the final rule, companies no longer have to report the type of commercial activity for each reportable chemical substance, whether a chemical is domestically manufactured or imported, nor the first and last date each chemical was manufactured.⁵⁹
- The final rule removed a list of specific questions corporations had to answer to substantiate a claim of confidentiality (e.g., "What harmful effects to your competitive position, if any, or to your supplier's competitive position, do you think would result from the identity of the chemical substance being disclosed in connection with reporting under this part?" "Has the identity of the chemical substance been kept confidential to the extent that your competitors do not know it is being manufactured

for a commercial purpose by anyone?" "What measures have been taken to prevent undesired disclosure of the fact that the chemical substance is being manufactured for a commercial purpose?").⁶⁰

As of the writing of this article, EDF has not submitted a merit's brief but has raised several questions to the court, including whether the final rule violates TSCA because it: (1) allows submitters to assert claims of CBI without meeting all of the requirements of TSCA; (2) exempts chemical products solely for export from the reporting requirements; and/or (3) allows EPA to designate substances as "active" regardless of whether the intended manufacturing or processing actually occurs.⁶¹ EPA will have sixty (60) days from the filing of EDF's merits brief to file its brief.⁶²

If the court holds that the rule is unlawful and sets it aside, EPA would have to promulgate new regulations and postpone implementation of the TSCA Amendments. Of particular note, however, is the fact that neither EPA nor the court has postponed the effective date of the notification rule. As such, unless otherwise exempt, all manufacturers and importers were required to submit the Notice of Activity—Form A on or before February 7, 2018. Moreover, as noted above, if a manufacturer has confidential business information but would otherwise fall into a reporting exemption, that manufacturer should have filed a Notice of Activity—Form A by February 7, 2018 or it risked losing a claim to CBI.

Areas of Risk and Potential Liability

With any new law and regulation comes new risk and potential liability. This is compounded by the TSCA Amendments' importance and the uncertainty surrounding the current administration's enforcement priorities. Although not intended to be exhaustive, the following areas of risk and potential liability may arise, particularly for corporate clients:

- ***Negative affect on production and use of chemicals that are limited or banned.*** EPA's determination that a chemical should be limited or banned would have a tremendous effect on those that produce and/or use the chemical. Affected companies will need to spend more money on production due to the limitations and/or other controls, and may need to invest in developing and testing alternative chemicals.
- ***Companies may have environmental liability long after a chemical is limited or banned.*** A determination by EPA that a chemical manufactured, imported, used, distributed, and/or disposed of by corporate clients should be limited or banned would not only affect production, but could also result in further liability if that chemical is found to have impacted the environment (e.g., polychlorinated biphenyls were banned under TSCA in 1979

but are still a major issue at many hazardous waste disposal sites).

- ***Companies will incur more costs when introducing new chemicals.*** Now that EPA must approve new chemicals before they enter the U.S. market, it will be harder and more expensive to introduce new chemicals. The TSCA Amendments place a higher burden on corporations, require more time, and add EPA fees and other costs to get a new chemical approved. Additionally, it may take EPA several years to finalize and fine-tune its new approval process, adding another level of uncertainty and potential for transaction costs.
- ***Any effect on production would also impact the supply chain.*** Downstream users who rely on chemical manufacturers or importers should be aware of the TSCA Amendments and monitor whether their suppliers are in compliance.
- ***Increased scrutiny could lead to more personal injury cases.*** As EPA more systematically determines whether chemical substances pose a risk of injury to health or the environment, companies that manufacture, import, use, distribute, and/or dispose of those chemical substances may see an increase in personal injury litigation and occupational exposure cases resulting from new or more widely disbursed information.
- ***Potential for new and previously “unknown conditions” under remediation programs.*** Increased testing could drive new standards for contaminants in soil, sediment, water, and air, and/or increased awareness of chemicals not otherwise regulated (e.g., similar to the recent activity surrounding perfluorooctanoic acid).⁶³ Increased scrutiny and new standards could bring with it new enforcement issues under clean-up programs, and may also affect otherwise closed and settled enforcement cases if they trigger re-opener statutes under state and federal laws.⁶⁴
- ***Potential for new environmental justice issues.*** The TSCA Amendments specifically include considerations of unreasonable risk to a potentially exposed or susceptible subpopulation, which includes but is not limited to infants, children, pregnant women, workers, or the elderly. Previously unknown liability could emerge if evaluations show a particular risk to a subpopulation.
- ***Disconnect between state and federal regulations.*** Although the TSCA Amendments attempted to address pre-emption issues, the new law could also present more confusion on what and when states can regulate. This area may become especially complicated if certain states (e.g., California already has an active Department of Toxic Substances Control)

determine that more stringent state regulations would be more effective than EPA oversight under the current administration.

Next Steps

Attorneys should continue to review their client’s risk profiles as TSCA Amendments are implemented and refined, including:

- Determine whether clients use, manufacture, distribute, process, import, and/or dispose of any of the ten (10) chemicals currently under review (i.e., Asbestos; 1-Bromopropane; Carbon Tetrachloride; 1, 4 Dioxane; Cyclic Aliphatic Bromide Cluster (HBCD); Methylene Chloride; N-Methylpyrrolidone; Perchloroethylene; Pigment Violet 29; and Trichloroethylene). If so, attorneys should monitor EPA’s process and consider submitting public comment(s) if regulations, limitations, and/or prohibitions are considered.
- Review active chemicals that clients have manufactured and/or imported for non-exempt purposes between June 21, 2006 and June 21, 2016, and ensure Notices of Activity—Form A were submitted by February 7, 2018. Remember that any chemical substance currently on the active list will be made public unless a new CBI request is received, so a Notice of Activity should be considered to protect CBI even if the chemical may otherwise be exempt.
- Participate in EPA’s process for prioritizing, evaluating and regulating chemicals.
- Continue to be mindful of touchpoints that could affect liability vis-a-vis employees, customers, and consumers, such as labelling, reporting, safety data sheets, employee training, and personal protection equipment.

Endnotes

1. See EDF Files Lawsuits to Defend Reforms to Chemical Safety Law, Env’tl. Def. Fund (Aug. 14, 2017), <https://www.edf.org/media/edf-files-lawsuits-defend-reforms-chemical-safety-law> (“Notably, the changes [to the final rules] from January’s proposed rules were directed at EPA by Dr. Nancy Beck, freshly arrived from the chemical industry’s main trade association, where she had authored industry comments on the proposed rules. She now serves as the top political official in EPA’s TSCA office.”).
2. 15 U.S.C. § 2607(b)(4)(A); 40 C.F.R. § 710.30(a)(1).
3. *Id.*
4. *Id.*
5. 15 U.S.C. § 2605(b)(1).
6. *Id.*
7. *Id.*
8. 15 U.S.C. § 2605(b)(3)(c).
9. 15 U.S.C. § 2605(b)(2)(A). The 10 substances currently under review are: Asbestos; 1-Bromopropane; Carbon Tetrachloride; 1, 4 Dioxane; Cyclic Aliphatic Bromide Cluster (HBCD); Methylene Chloride; N-Methylpyrrolidone; Perchloroethylene; Pigment Violet 29; and Trichloroethylene. Scopes of the Risk Evaluations to be

- Conducted for the First Ten Chemical Substances Under the TSCA, 82 Fed. Reg. 31,592, 31,593.
10. 15 U.S.C. § 2605(b)(2)(B).
 11. 15 U.S.C. § 2605(b)(4).
 12. 15 U.S.C. § 2605(c)(1).
 13. 15 U.S.C. § 2605(c)(2).
 14. *See generally*, Richard A. Denison, *A Primer on the New Toxic Substances Control Act (TSCA) and What Lead to It*, Env'tl. Def. Fund (April 2017), <http://blogs.edf.org/health/files/2017/04/Denison-Primer-on-Lautenberg-Act-FINAL.pdf>.
 15. *Id.*
 16. *Id.*
 17. 15 U.S.C. § 2604(a)(3).
 18. 15 U.S.C. § 2604(a)(4).
 19. 15 U.S.C. § 2603(a)(1).
 20. 15 U.S.C. § 2603(a)(2).
 21. 15 U.S.C. § 2617(b).
 22. 15 U.S.C. § 2617(a)(1); 15 U.S.C. § 2617(c).
 23. *Denison*, *supra* note 14, at 7.
 24. 15 U.S.C. § 2613(c).
 25. 15 U.S.C. § 2613(e).
 26. 15 U.S.C. § 2625(3); 15 U.S.C. § 2625(4).
 27. 40 C.F.R. § 702.5(a).
 28. 40 C.F.R. § 702.5(c).
 29. 40 C.F.R. § 702.7.
 30. 40 C.F.R. § 702.11.
 31. 40 C.F.R. § 702.17.
 32. *Id.*
 33. 40 C.F.R. § 702.49(b).
 34. 40 C.F.R. § 702.49(c).
 35. Final TSCA Framework Rules “Significantly Weakened,” Env'tl. Def. Fund (June 22, 2017), <https://www.edf.org/media/final-tsca-framework-rules-significantly-weakened-edf>.
 36. *Compare* 40 C.F.R. § 702.37(a), with Procedure for Chemical Risk Evaluation Under the Amended TSCA, 82 Fed. Reg. 7562, 7576 (to be codified at 40 C.F.R. pt. 702) (to be codified at 40 C.F.R. pt. 702).
 37. *Compare* 40 C.F.R. § 702.37(b)(4), with Procedure for Chemical Risk Evaluation Under the Amended TSCA, 82 Fed. Reg. 7562, 7576 (to be codified at 40 C.F.R. pt. 702).
 38. *Safer Chemicals v. USEPA*, Case No. 17- 72260 (9th Cir. filed Aug. 10, 2017).
 39. *All. of Nurses for Healthy Env'ts. v. USEPA*, Case No. 17- 1926 (4th Cir. filed Aug. 11, 2017). The Court of Appeals for the Ninth Circuit denied a motion to transfer the prioritization rule to the Fourth Circuit.
 40. *Safer Chemicals v. USEPA*, Case No. 17- 72260 (9th Cir. filed Aug. 10, 2017) (order denying motion to transfer).
 41. 40 C.F.R. § 710.25; 40 C.F.R. § 710.30(a)(1).
 42. 15 U.S.C. § 2602(13) & (14).
 43. 40 C.F.R. § 710.30(a)(1).
 44. 40 C.F.R. § 710.37(a).
 45. 40 C.F.R. § 710.30(b).
 46. 40 C.F.R. § 710.39(a).
 47. 40 C.F.R. § 710.35.
 48. 40 C.F.R. § 710.4(c)(3); 40 C.F.R. § 710.27(a)(1).
 49. 40 C.F.R. § 710.25(a).
 50. 40 C.F.R. § 710.27(a)(2).
 51. 40 C.F.R. § 710.27(a)(3).
 52. 40 C.F.R. § 710.27(a)(5).
 53. 40 C.F.R. § 710.27(b)(2).
 54. TSCA Inventory Notification (Active-Inactive) Requirements, 82 Fed. Reg. 37,520, 37,524 (to be codified at 40 C.F.R. pt. 710).
 55. *Id.*; 40 C.F.R. § 710.37(a).
 56. *See generally* *Env'tl. Def. Fund v. USEPA*, Case No. 17-1201 (D.C. Cir. 2017 filed Sept. 1, 2017). The following parties have also filed motions to intervene: American Chemistry Council, American Fuel & Petrochemical Manufacturers, American Petroleum Institute, Chamber of Commerce of the United States of America, Society of Chemical Manufacturers and Affiliates, American Coatings Association, American Coke and Coal Chemicals Institute, American Forest & Paper Association, EPS Industry Alliance, IPC International, Inc., doing business as IPC—Association Connecting Electronics Industries, National Association of Chemical Distributors, National Association of Manufacturers, National Mining Association, and Polyurethane Manufacturers Association. Certificate as to Parties, Rulings, and Related Cases at 1–2, *Env'tl. Def. Fund v. USEPA*, No. 17-1201 (D.C. Cir. filed Nov. 8, 2017).
 57. *See supra* note 1.
 58. *Compare* 40 C.F.R. § 710.27(a)(4), and 40 C.F.R. § 710.27(a)(5), with TSCA Inventory Notification (Active-Inactive) Requirements, 82 Fed. Reg. 4255, 4266 (to be codified at 40 C.F.R. pt. 710).
 59. *Compare* 40 C.F.R. § 710.29(b), with TSCA Inventory Notification (Active-Inactive) Requirements, 82 Fed. Reg. 4255, 4266 (to be codified at 40 C.F.R. pt. 710).
 60. *Compare* 40 C.F.R. § 710.37(a)(2), with TSCA Inventory Notification (Active-Inactive) Requirements, 82 Fed. Reg. 4255, 4268 (to be codified at 40 C.F.R. pt. 710).
 61. Petitioner’s Nonbinding Statement of Issues to be Raised, *Env'tl. Def. Fund v. USEPA*, No. 17-1201 (D.C. Cir. filed Nov. 9, 2017).
 62. Unopposed Motion to Establish Extended Briefing Schedule at ¶5, *Env'tl. Def. Fund v. USEPA*, No. 17-1201 (D.C. Cir. filed Nov. 7, 2017).
 63. Drinking Water Health Advisories for PFOA and PFOS, U.S. Env'tl. Prot. Agency, <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos> (last updated August 30, 2017).
 64. *See, e.g.*, 42 U.S.C. § 9622(f)(6)(A) (€A) covenant not to sue a person concerning future liability to the United States [under Comprehensive Environmental Response, Compensation, and Liability Act] shall include an exception to the covenant that allows the President to sue such person concerning future liability resulting from the release or threatened release that is the subject of the covenant where such liability arises out of conditions which are unknown at the time the President certifies under paragraph (3) that remedial action has been completed at the facility concerned.).

Recent Decisions and Legislation in Environmental Law

Recent Decisions

***Coalition for Competitive Elec. v. Zibelman*,
272 F. Supp. 3d 554 (S.D.N.Y. 2017)**

Facts

As a tool to combat climate change, New York has initiated programs aimed at decreasing carbon dioxide emissions, including the Clean Energy Standards (CES), the Renewable Energy Credits (RECs) and Zero-Emissions Credits (ZECs) programs.¹ Electricity generators harnessing renewable sources are awarded a REC for each megawatt-hour of electricity produced, which is then purchased by New York State Energy Research and Development Authority (NYSERDA), subsidizing the cost of production.² Through the ZEC program, eligible nuclear generators are awarded “a credit for the zero-emissions attributes of one megawatt-hour of electricity production.”³ Nuclear generators may receive ZECs if they have “historically contributed to the resource mix of clean energy consumed by New York retail customers” and make a showing of “public necessity.”⁴ NYSERDA then purchases the ZECs from generators and retail suppliers purchase ZECs from NYSERDA “in an amount proportional to their customer’s share of the total energy consumed.”⁵ Coalition for Competitive Electricity, a group of electricity generators that are not eligible to receive this credit, challenge the constitutionality of the credit system administered by the New York Public Service Commission.⁶

Procedural History

The case was heard by the Southern District of New York on a Federal Rules of Civil Procedure 12(b)(6) motion to dismiss.⁷

Issue

Whether New York’s ZEC program is unconstitutional as it is preempted under the Federal Power Act (FPA) and further violates the dormant commerce clause.⁸

Rationale

For the court to hear cases under the doctrine of preemption, a federal statute must create a private right of action or the court must determine that there is equity jurisdiction over the claim.⁹ The Southern District found that the first requirement of *Armstrong v. Exceptional Child Care Ctr., Inc.* was satisfied as “the FPA precludes private enforcement except as provided by [the Public Utility Regulatory Policies Act]” (PURPA) while the second—“a judicially unadministrable standard”—was not satisfied.¹⁰ Yet, “the limited private right of action provided by PURPA is by itself sufficient to establish that Congress

intended to foreclose equitable relief”; therefore, the court found that it lacked equity jurisdiction to hear the claim.¹¹

Although the court found there was not equity jurisdiction, it nonetheless determined that plaintiff’s preemption claims would otherwise fail.¹² Indicating that participation in the auction is not required to receive ZECs, the court stressed that not only is the use of ZECs by the generators a business decision, not a state mandate, but the program itself does not attempt to set prices of electricity in the state auction and the effect the program has on pricing does not make it so.¹³ The court further indicated that the state program falls in line with the FERC’s policy objectives “of [having] an efficient energy market, [as] it encourages through financial incentives the productive of certain energy.”¹⁴ Therefore, there was no evidence to support a finding that the New York ZEC program was federally preempted.¹⁵

Next, the court determined plaintiffs lacked a cause of action under the dormant Commerce Clause. To gain protection under the dormant Commerce Clause, “the interest sought to be protected must be at least arguably within the zone of interests to be protected by the dormant Commerce Clause,” which here it was not.¹⁶ Further, even if the plaintiffs had a cause of action under the dormant Commerce Clause, this claim would fail as New York is participating in the market, not regulating.¹⁷

Conclusion

The Southern District of New York upheld the validity of the ZEC program and granted the defendant’s motion to dismiss as the plaintiffs did not have the right to raise the preemption claims under equity jurisdiction, and nonetheless the program was neither field nor conflict preempted and did not violate the dormant Commerce Clause.¹⁸

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Endnotes

1. *Coalition for Competitive Elec. v. Zibelman*, 272 F. Supp. 3d 554, 561 (S.D.N.Y. 2017).
2. *Id.*
3. *Id.*
4. *Id.* at 562.
5. *Id.*
6. *Id.* at 559.
7. *Id.*
8. *Id.*
9. *Id.* at 563–64.
10. *Id.* at 565 (citing *Armstrong v. Exceptional Child Care Ctr., Inc.*, 135 S. Ct. 1378, 1383 (2015)).
11. *Coalition for Competitive Elec.*, 272 F. Supp. 3d 566.

12. *Id.* at 567.
13. *Id.* at 570.
14. *Id.* at 577.
15. *Id.* at 581.
16. *Id.* at 583.
17. *Id.*
18. *Id.* at 586.

***Constitution Pipeline Co. v. N.Y. State
Dep't of Env'tl. Conservation*, 868 F.3d 87
(2d Cir. 2017)**

Facts

Constitution Pipeline Company, LLC (“Constitution”) seeks to construct a 121-mile pipeline through Pennsylvania and New York.¹ The Federal Energy Regulatory Commission (FERC) prepared an environmental impact statement for the project and requested that Constitution submit a feasibility study explaining the method the company would use to install the pipeline across waterbodies.² Through this study Constitution determined that only 13 of the 251 waterbodies would be crossed with trenchless method, by considering only those waterbodies which were designated as high quality or sensitive, streams over 30-feet wide, and available finances.³ In New York State, the preferred crossing method is the trenchless crossing method, specifically horizontal directional drilling. Since Constitution only used this method for 13 of the water bodies, New York State Department of Environmental Conservation (DEC) requested that a more in-depth analysis be completed, which Constitution failed to do.⁴ Having failed to further analyze these streams and give a detailed blasting plan for the waterbody crossings in New York, the application “failed to provide sufficient information” and was thus denied the permit.⁵

Procedural History

This matter involves review of a DEC decision. As provided through the Natural Gas Act, the United States Court of Appeals for the circuit where the decision was made has original and exclusive jurisdiction to review the decision of the federal agency.⁶

Issue

Whether NYSDEC failed to render a final decision within a reasonable time, resulting in a waiver of the permit application,⁷ and whether as Constitution argues the permit denial was arbitrary, capricious, and ultra vires and therefore NYSDEC should be required to issue the permit.⁸

Rationale

The Second Circuit found that the court lacked subject matter jurisdiction regarding the first challenge

brought by Constitution.⁹ While the court has jurisdiction in challenges of decisions made by federal agencies, this does not extend to where the challenger alleges that the agency failed to act, as Constitution does here.¹⁰ In these cases, the United States Court of Appeals for the Federal Circuit has original and exclusive jurisdiction, and therefore this claim was improperly brought before the Second Circuit.¹¹

As to Constitution’s second argument challenging the merits of the NYDEC decision, the Second Circuit found that the NYSDEC was within its power denying the application as the state agency has the power to “veto[] an energy pipeline that has secured approval from a host of other federal and state agencies.”¹² By deferring to the agency, the Second Circuit found that there was sufficient evidence to provide “rational support for the choice made by the agency.”¹³ Where, as here, there has been a denial of a permit application “where [the agency] has already determined that additional information is needed, and the applicant refuses to supply it,” no less deference is needed.¹⁴ While “an agency’s decision may be found ‘arbitrary and capricious’ for ‘issuing a permit with insufficient information,’” denying a permit for the same reason may not.¹⁵

Conclusion

The Second Circuit dismissed the timeliness challenge for lack of jurisdiction, as it had not been properly brought to the court, and denied the merits challenge to the denial of the permit application as it was not arbitrary and capricious.¹⁶

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Endnotes

1. *Constitution Pipeline Co. v. N.Y. State Dep’t of Env’tl. Conservation*, 868 F.3d 87, 91 (2d Cir. 2017).
2. *Id.*
3. *Id.* at 92.
4. *Id.* at 94–95.
5. *Id.* at 96 (quoting NYSDEC Decision at 1).
6. *Constitution Pipeline Co.*, 868 F.3d at 99.
7. *Id.* at 98.
8. *Id.*
9. *Id.* at 100.
10. *Id.*
11. *Id.* at 99.
12. *Id.* at 101.
13. *Id.* at 102.
14. *Id.* at 103.
15. *Id.* at 103 (quoting *Utahns For Better Transportation v. United States Department of Transportation*, 305 F.3d 1152, 1192 (10th Cir. 2002)).
16. *Constitution Pipeline Co.*, 868 F.3d at 103.

***In re Friends of P.S. 163, Inc. v. Jewish Home Lifecare*, 30 N.Y.3d 416 (2017)**

Facts

Applicant Jewish Home Lifecare (JHL) sought to construct a 414-bed nursing home in New York City.¹ In connection with this application, JHL submitted to New York Department of Health the required Environmental Assessment Statement, triggering SEQRA review.² DOH assumed SEQRA lead agency status, and prepared a draft environment impact statement (DEIS) that “analyzed, among other environmental matters, the potential impact on public health of exposure to hazardous materials . . . as well as the effects of construction noise.”³ Seeking to annul the DEIS, petitioners, an organization of parents of public school students, brought an Article 78 proceeding alleging that the DOH had “relied on flawed assessment methodology and failed to adequately mitigate the environmental dangers associated with construction.”⁴ Petitioners expressed concern over the presence of soil-based lead and potential lead dust migration, and claimed that the “DOH’s soil-sample evidence was insufficient and resulted in unsupported conclusions about the risk posed by lead at the construction site.”⁵

Procedural History

The Supreme Court, New York County, remitted the matter to DOH for preparation of an amended Final Environmental Impact Statement (FEIS) to reconsider findings on issues of noise and hazardous materials. The Supreme Court, Appellate Division, reversed and petitioners appealed.⁶

Issue

Whether the DOH complied with its SEQRA assessment responsibilities to protect public health and safety in the application process for construction of the nursing home facility.

Rationale

In reviewing the Department’s assessments of the DEIS, the court gave deference to DOH as “it is not the role of the courts to weigh the desirability of any action or choose among alternatives” but only to determine whether the agency took “a hard look” at the environmental concerns thus satisfying the requirements of SEQRA.⁷ Looking at the ways in which DOH collected information, the standards followed, and the sources on which DOH relied, the court found that the Department had taken the requisite “hard look,” satisfying SEQRA.⁸

Finding that the DOH assessments contained in the DEIS and the SEQRA process were reasonable, the court noted that the Department had “taken and analyzed [the soil samples] according to a technically sound methodology [completed] by expert consultants.”⁹ It determined that the DOH had followed state and federal standards,

including those prescribed by the Environmental Protection Agency.¹⁰ Therefore, the determinations were not arbitrary or capricious as the Department was legally allowed to rely on the sources it used to make its determinations.¹¹

Conclusion

The court disagreed with the petitioner’s claims, holding that the DOH took the proper requisite “hard look” at the potential risk posed by soil-based lead contamination and potential lead dust migration.¹²

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Endnotes

1. *In re Friends of P.S. 163, Inc. v. Jewish Home Lifecare*, 30 N.Y.3d 416, 426 (2017).
2. *Id.*
3. *Id.*
4. *Id.* at 429.
5. *Id.* at 431.
6. *Id.* at 429–30.
7. *Id.* at 430 (quoting *In re Jackson*, 67 N.Y.2d 400, 416 (1986)).
8. *In re Friends of P.S. 163*, 30 N.Y.3d at 431.
9. *Id.*
10. *Id.*
11. *Id.*
12. *Id.* at 433.

***Global Companies LLC v. New York State Department of Environmental Conservation*, 64 N.Y.S.3d 133, 2017 N.Y. Slip Op. 07495**

Facts

Petitioner Global Companies, LLC maintains a 63-acre petroleum storage and transfer facility in the City of Albany, for which petitioner had submitted an application to respondent, the New York State Department of Environmental Conservation (DEC), in June 2013.¹ This application requested modification of petitioner’s permit under Title V of the Clean Air Act and sought to expand crude oil storage capabilities.² In November 2013, DEC issued a notice of complete application (NOCA), informing the petitioner that a technical review had commenced and that an 18-month period for public comment was required regarding petitioner’s application.³ DEC rendered a negative declaration after a review of the application under the State Environmental Quality Review Act (SEQRA).⁴

In April 2014 the Environmental Protection Agency (EPA) submitted a letter to DEC questioning the petitioner’s calculation of the project’s emission potential of volatile organic compounds.⁵ In June 2014, respondents Charlene Benton (president of the Ezra Prentice Home

Tenants Association) and several environmental groups (collectively Benton proceeding), filed a combined CPLR article 78 proceeding seeking a judgment declaring that the issuance of a negative declaration under SEQRA was unlawful and to annul the negative declaration.⁶ The Benton proceeding was commenced after DEC notified petitioner that it was rescinding the NOCA and intended to rescind the negative SEQRA declaration.⁷

Procedural History

Petitioner filed an Article 78 proceeding and action for declaratory judgment against the DEC and various DEC representatives seeking a judgment: (1) compelling DEC to make a final decision on its permit application, (2) annulling DEC's rescission of the NOCA and compelling DEC to complete its review of the permit application, (3) that DEC failed to act in a timely manner and could not rescind the negative SEQRA declaration, and (4) compelling DEC to issue an amended negative SEQRA declaration.⁸

DEC sought dismissal of the cause of action.⁹ Thereafter, the Benton proceeding moved to intervene and consolidate the two Article 78 proceedings.¹⁰ DEC respondents cross-moved to join the matter with the Benton proceeding.¹¹

After oral arguments, the supreme court granted the Benton respondents' motion for permissive intervention, remanded the matter to DEC and directed it to render a decision on the permit application within 60 days, and dismissed petitioner's third and fourth causes of action on ripeness grounds.¹²

Petitioner and respondents appealed.

Issue

Whether the supreme court (1) properly granted intervenor status to the Benton respondents and appropriately joined the two actions; (2) may direct DEC to act on the permit application within 60 days; and (3) whether DEC's rescission of the negative declaration under SEQRA was timely.

Rationale

The appellate division ruled that the supreme court properly granted intervenor status to the Benton respondents and joined the two actions.¹³ The trial court permits an intervention "when the person's claim or defense and the main action have a common question of law or fact."¹⁴ In this case, the relief requested in the Benton proceeding's Article 78 action challenges the same permit application raised in the Article 78 proceeding between Global Companies, LLC, and DEC.¹⁵ Additionally, the Benton proceeding's Article 78 action has established common questions of law and fact and a "direct and substantial interest in the outcome of the proceeding" as the second Article 78 action.¹⁶

The appellate division ruled that the supreme court erred in granting mandamus relief by directing DEC to act on the permit application within 60 days.¹⁷ The supreme court erred in its ruling regarding this matter because DEC was authorized to rescind the NOCA and the rescission of the NOCA was both timely and rationally based.¹⁸

The appellate division ruled that the rescission of the NOCA and the intent to rescind the negative declaration were timely. First, the NOCA rescission was issued on the last day of the deadline, and was therefore timely.¹⁹ Further, because the DEC rescinded the NOCA within the lawful requirement, the notice of intent to rescind the negative declaration was also timely because there had been no final decision on the permit modification and the 18-month deadline for public commenting period had run.²⁰

Conclusion

The appellate division ruled that the trial court acted within its discretion in granting intervenor status to the Benton proceeding and consolidating the action with the Benton proceeding. However, the trial court erred in granting mandamus relief by directing DEC to act on the permit application within 60 days because the DEC acted within its discretion in revoking the NOCA. The revocation of the NOCA was within DEC's discretion because the revocation was made in a timely manner.

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Endnotes

1. *Global Companies LLC v. New York State Department of Environmental Conservation*, 155 A.D.3d 93, 135 (2017).
2. *Global Companies LLC*, 155 A.D.3d at 135.
3. *Id.*
4. *Id.*
5. *Id.*
6. *Id.*
7. *Global Companies LLC*, 155 A.D.3d at 135–36.
8. *Id.* at 136.
9. *Id.*
10. *Id.*
11. *Id.*
12. *Id.*
13. *Id.*
14. *Global Companies LLC*, 155 A.D.3d at 136.
15. *Id.*
16. *Id.*
17. *Id.*
18. *Id.*
19. *Global Companies LLC*, 155 A.D.3d at 139.
20. *Id.*

**People v. BP P.L.C., Case 3;16-cv-06012 WHA
(N.D. Cal. 2018)**

Facts

Oakland and San Francisco (“Plaintiffs”) brought a global warming nuisance action against BP P.L.C., Chevron Corporation, ConocoPhillips Company, Exxon Mobil Corporation, and Royal Dutch Shell plc (“Defendants”),¹ who are all considered large producers of fossil fuels. Plaintiffs alleged that “the combustion (by others) of fossil fuels produced by defendants has increased atmospheric levels of carbon dioxide and, as a result, raised global temperatures and melted glaciers to cause a rise in sea levels, and thus caused flooding in Oakland and San Francisco.”²

Procedural History

Defendants removed the action and the Plaintiffs moved to remand the action to state court.

Issue

Whether the Plaintiffs’ claim that Defendants are violating state nuisance law is a federal question that can be heard by the federal courts.

Rationale

In *Am Elec. Power Co., Inc. v. Connecticut*, 564 U.S. 410, 421 (2011), the Supreme Court determined that environmental protection is an area within the power of the national legislature and, if needed, actions can be brought to federal courts.³ The Court did not make a determination on the relevant state law claim, but held that a federal Act will necessarily preempt a state law claim.⁴ Further, in *Native Village of Kivalina v. ExxonMobil Corp.*, 696 F.3d 849 (9th Cir. 2012), the Court held that the Clean Air Act “displaced any federal common law nuisances claims for damages caused by global warming.”⁵

Here, the Plaintiffs raised three arguments to avoid federal common law. The first was that contrary to previous case law, their nuisance claims were brought against the sellers of the product, rather than the dischargers of the pollutants.⁶ The Court found the argument unpersuasive, stating that “the transboundary problem of global warming raises exactly the sort of federal interests that necessitate a uniform solution” regardless of whether the pollutant comes from a seller or a discharger.⁷

The second argument was that even if their claims are grounded in interstate pollution, the Clean Air Act displaces other federal common law claims.⁸ The Plaintiffs argued that since the Clean Air Act displaces federal common law, the state law is then available because the statute does not preempt it.⁹ However, the two cases that Plaintiffs relied on, *AEP* and *Kivalina*, did not recognize the displacement issue as it was raised in this case. The issue in *AEP* and *Kivalina* involved emitters, and here the issue revolve around the flow of fossil fuels into interstate

commerce.¹⁰ For displacement to occur, “the existence of laws generally applicable to the question is not sufficient; the applicability of displacement is an issue-specific inquiry.”¹¹ Thus the Court determined that this reasoning was not persuasive.

The third argument centered on the fact that the well-pleaded complaint rule does bar removal of actions.¹² The Court determined that even though the Plaintiffs’ nuisance claim was a state law claim, because it depends on a global complex of cause and effect and involves the entire planet, it is a well-pleaded federal law claim and federal jurisdiction is proper.¹³

Conclusion

The District Court for the Northern District of California denied the Plaintiff’s motion to remand, asserting that the claim “necessarily involves the relationship between the United States and all other Nations. It demands to be governed by as universal a rule of apportioning responsibility as is available. This order does not address whether (or not) plaintiffs have stated claims for relief. But plaintiffs’ claims, if any, are governed by federal common law.”¹⁴

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Endnotes

1. *People v. BP P.L.C.*, Case 3;16-cv-06012 WHA, at 1 (N.D. Cal. 2018).
2. *Id.* at 2–3.
3. *Id.* at 4.
4. *Id.*
5. *Id.*
6. *Id.* at 5.
7. *Id.*
8. *Id.* at 6.
9. *Id.*
10. *Id.*
11. *Id.* at 7.
12. *Id.*
13. *Id.* at 8.
14. *Id.*

**In re Green Earth Farms Rockland, LLC v.
Town of Haverstraw Planning Board, 60
N.Y.S.3d 381 (App. Div. 2017)**

Facts

In 2004, the developer, Davies Farm, LLC, applied to the Town of Haverstraw Planning Board (hereinafter the Planning Board) for site plan approval and a zoning amendment in order to residentially and commercially develop a 53.3-acre parcel, located in the towns of Haverstraw and Ramapo.¹ In 2005, a draft environmental im-

pact statement was requested, after which Davies Farm, LLC changed the development plan and eliminated the proposed residential development.² In 2009, the Planning Board accepted the Supplemental Environmental Impact Statement (hereinafter SEIS), which was requested as a response to the adjusted proposed development plan.³ The board “adopted a findings statement certifying that the approved supplemental proposed development plan minimized or avoided adverse environmental impacts to the maximum extent practicable.”⁴ After the initial adoption, the proposed Ramapo commercial development plan was changed to include a deli/coffee shop with gas pumps in the Town of Ramapo, as well as a convenience store with 16 gas pumps.⁵ The Planning Board determined that an additional SEIS was not required and granted final site approval.⁶

Procedural History

The petitioners brought this Article 78 proceeding against the Planning Board, Mt. Ivy Partners, Inc., and the Town of Haverstraw Building Department.⁷ The petition sought a review of the Planning Board’s determination that a second SEIS was not necessary.⁸ Supreme Court, Rockland County, granted the petition, annulled the sight plan approval, and remitted the matter to the Planning Board for the purpose of performing a second SEIS.⁹ The second SEIS would be limited to “examining whether there was significant adverse environmental impacts arising from the proposed construction of the gas station.”¹⁰ The respondents appealed this granting.¹¹

Issue

The first issue was whether each petitioner, individually, had standing to bring the action.¹² The second issue, regarding the approval of the site plan, is whether the Planning Board failed to comply with the substantive requirements of the State Environmental Quality Review Act (hereinafter SEQRA) in determining that a second SEIS was not required prior to the site plan’s approval.¹³

Rationale

In order “to establish standing under SEQRA a petitioner must show (1) an environmental injury that is in some way different from that of the public at large, and (2) that the alleged injury falls within the zone of interests sought to be protected or promoted by SEQRA.”¹⁴ The court held that owners of neighboring properties to a proposed development might have standing based on proximity to the development project, and the lower court properly inferred an injury in fact to those petitioners located within 500 feet.¹⁵ However, the court held that the petitioner whose home was located more than 2,000 feet from the development project did not establish an injury different from the public at large and therefore lacked standing.

Further, the court determined that the Supreme Court had properly held that the Planning Board failed to com-

ply with the requirements of SEQRA in its determination that a second SEIS was not required after the alteration in the site plan.¹⁶ In evaluating whether the agency met the requirements of SEQRA the court looks to “whether the agency identified the relevant areas of environmental concern, took a hard look at them, and made a reasoned elaboration of the basis for the determination.”¹⁷ Here, the court determined that the alterations made to the development plan following the original SEIS resulted in the Planning Board failing to take the requisite “hard look” at the environmental consequences of the action.¹⁸

Conclusion

The Supreme Court, Appellate Division, determined that the Planning Board failed to comply with the requirements of SEQRA when it determined that the second SEIS was not necessary.

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Endnotes

1. *In re Green Earth Farms Rockland, LLC v. Town of Haverstraw Planning Board*, 60 N.Y.S.3d 381, 383 (App. Div. 2017).
2. *Id.* at 384.
3. *Id.*
4. *Id.*
5. *Id.*
6. *Id.*
7. *Id.*
8. *Id.*
9. *Id.*
10. *Id.*
11. *Id.*
12. *Id.* at 385.
13. *Id.* at 386.
14. *Id.*
15. *Id.* at 385.
16. *Id.* at 386.
17. *Id.* (quoting *Matter of Chinese Staff & Workers’ Assn. v. Burden*, 19 N.Y.3d 922, 924 (2012)).
18. *Green Earth Farms Rockland, LLC*, 60 N.Y.S.3d at 387.

***Shapiro v. Planning Bd. of Town of Ramapo*, 155 A.D.3d 741, 65 N.Y.S.3d 54 (App. Div. 2017)**

Facts

On March 22, 2013, the Planning Board of the Town of Ramapo (“Planning Board”) granted three applications for Scenic Development, LLC (“Scenic”) for final subdivision and site plan approval of three housing development projects.¹ However, Scenic’s project would delineate a wetland and required jurisdictional deter-

mination from the United States Army Corps of Engineers (ACE).² Through its review, the Planning Board believed that it received jurisdictional determination in letters from ACE on February 1, 2007 and in January and November of 2011, which stated that it had reviewed Scenic's development plans.³ These letters, however, addressed the original 139-home proposal,⁴ and not Scenic's amended plan to build 497-units.⁵ In addition, the letters from ACE did not indicate that ACE had reached a jurisdictional determination regarding Scenic's proposed projects.⁶ Prior to the initiation of this suit, the Planning Board received determination from the New York State Department of Environmental Conservation, indicating that the letters received are not sufficient to constitute a jurisdictional determination.⁷

Procedural History

Petitioners appealed from the trial court's ruling in a CPLR article 78 regarding the final subdivision and site plan approvals made by the Planning Board of the Town of Ramapo and whether a Supplemental Environmental Impact Statement (SEIS) was needed.⁸

Issue

Whether an SEIS was needed in order to effectively approve the final subdivision and site plan approvals.

Rationale

The court established that a lead agency's determination as to whether a SEIS is required is discretionary and may require an SEIS "limited to the specific significant adverse environmental impacts not addressed or inadequately addressed in the EIS."⁹ The SEIS may be required when there are "(a) changes proposed for the project; (b) newly discovered information; or (c) a change in circumstances related to the project" that were not sufficiently included in the EIS.¹⁰

In the present instance, the Planning Board's reliance on the letters from ACE as a jurisdictional determination was unsound because the letters themselves stated that they did not constitute a jurisdictional determination.¹¹ Moreover, ACE had only reviewed the initial 139-home plan, and not the 497-unit plan, and so further determination by ACE was required.¹² Since the amended proposal was not reviewed by ACE, the Planning Board's reliance on the letters from ACE as a jurisdictional determination was unreasonable and irrational.¹³ Thus, the reliance on the letters did not equal a hard look at the environmental concerns identified nor did it equal a reasonable elaboration for the Planning Board's determination.¹⁴

Conclusion

The court remitted the matter to Planning Board and ordered it to prepare an SEIS regarding the presence of wetlands on the subject property and the amended project plans.¹⁵ Additionally, the court held that the remain-

ing contentions regarding the final subdivision and site plan approval did not need to be "addressed in light of this determination or are without merit."¹⁶

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Endnotes

1. *Shapiro v. Planning Bd. of Town of Ramapo*, 155 A.D.3d 741, 742 (App. Div. 2017).
2. *Id.* at 744.
3. *Id.*
4. *Id.*
5. *See id.*
6. *Id.* at 745.
7. *Id.*
8. *Id.* at 742.
9. *Id.* at 743.
10. *Id.* (citing 6 NYCRR 617(a)(7)(i); *Matter of Riverkeeper, Inc. v. Planning Bd. of Town of Southeast*, 9 N.Y.3d 219, 231 (2007)).
11. *Shapiro*, 155 A.D.3d at 744-45.
12. *Id.* at 745.
13. *Id.* at 744.
14. *Id.* at 745.
15. *Id.* at 746.
16. *Id.*

Sierra Club v. Martens, 2018 WL 343744 (2018)

Facts

In 1963, Trans Canada Ravenswood, LLC (Ravenswood) began operating a thermoelectric generating station which required a withdrawal of 1.5 billion gallons of water per day to operate.¹ Under the Federal Clean Water Act, the New York State Department of Environmental Conservation (DEC) regulated Ravenswood's operation.² In 2005, Ravenswood implemented water withdrawal technology that reduced the environmental consequences of fish loss from 83,000 to 25,000 fish and 220 million to 150 million fish eggs.³ In 2011, the New York State Legislature amended § 15 of the Environmental Conservation Law (ECL) by enacting the Water Resource Protection Act (WRPA), requiring that all commercial and industrial operations that withdraw more than 100,000 gallons of water per day obtain a permit.⁴ The WRPA also granted the DEC the discretionary authority to issue initial permits prior to the acts effective date. The DEC granted Ravenswood an initial permit to withdraw 1.5 billion gallons of water per day, determining that the permit did not fall under the State Environmental Quality Review Act (SEQRA).⁵

Procedural History

The petitioners appealed from a 2014 Supreme Court judgement that affirmed the granting of an initial permit

to Ravenswood under the discretionary authority granted to the DEC by the WRPA.⁶

Issue

Whether the DEC failed to properly classify Ravenswood application under SEQRA requirements.

Rationale

Prior to the effective date of the WRPA, ECL § 15 granted the DEC the authority to grant or deny a permit by reviewing two statutory factors: (1) whether the proposed withdrawal would not result in any adverse impact on the quantity or quality of the water source, and (2) whether the withdrawal would incorporate economically and environmentally sound measures.⁷ SEQRA requires the consideration of environmental factors in all actions when issuing permits. The SEQRA grants the discretionary authority to the DEC to classify environmental actions under two types: (1) an action is likely to have a [significant] adverse impact on the environment, and (2) an action is not likely to have a significant impact on the environment.⁸ However, the discretionary authority of the DEC prior to following the WRPA still falls under the standards of ECL § 15.⁹

Conclusion

The court granted the petition, holding that the DEC failed to follow standards originally established by the ECL § 15 prior to the effective date of the WRPA.

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Endnotes

1. *Sierra Club v. Martens*, 2018 WL 343744 (2018).
2. *Id.*
3. *Id.*
4. *Id.*
5. *Id.* at 3.
6. *Id.* at 1.
7. *Id.* at 2.
8. *Id.* at 4 (quoting *Matter of South Bronx Unite! v. New York City Indus. Dev. Agency*, 115 A.D.3d 607, 609 n. 4, 983 N.Y.S.2d 8).
9. *Id.*

**Zbitnoff v. James, 708 F. App'x 25
(2d Cir. 2017)**

Facts

The Air Force seeks to deploy newly manufactured F-35A Lighting II (F-35) fighter jets to Air Force bases across the country. The Air Force chose the Burlington Air National Guard station ("the station") as one site for these jets.¹ As required by the National Environmental Policy Act (NEPA), the Air Force completed an Environ-

mental Impact Statement (EIS), which analyzed the environmental impacts of the decision to base the F-35s at the station.² The final EIS was released in August 2013 and covered many different areas of environmental concern, "includ[ing] the construction of new hangar facilities, effects on traffic, noise from aircraft operations, contamination of the atmosphere and the soil, automobile traffic, and a host of other potential impacts."³

Procedural History

This matter appealed a decision of the United States District Court for the District of Vermont⁴ deciding in favor of the Secretary on a motion for summary judgment, following a jurisdictional opinion by the Supreme Court of Vermont.⁵

Issue

Plaintiffs-Appellants, citizens of the South Burlington area, alleged that the Secretary "failed to apprise the public of information she necessarily considered when reaching her determination," specifically the cost savings of basing the F-35s at the station as compared to other possible locations.⁶ Additionally, Plaintiffs-Appellants alleged that the EIS failed to consider state and local land-use laws, specifically Vermont Act 250 (Vt. Stat. Ann., tit. 10 §§ 6001-6111) and the Comprehensive Plan for the City of South Burlington.⁷

Rationale

First, the court determined that the Secretary fully evaluated those factors that NEPA requires in the EIS. Examining circuit precedent, the court concluded that NEPA's scope is limited and "does not require the agency to assess every impact or effect of its proposed action, but only the impact or effect on the environment."⁸ Therefore, the Secretary complied with the requirements of NEPA and did not need to disclose the cost-benefit analysis that occurred or the financial savings of the basing decision within the EIS because this was not an environmental impact.⁹

Second, the court looked to the jurisdictional decision rendered by the Supreme Court of Vermont which determined that the state permitting requirement under Act 250 was preempted by federal law and the development was not for the required "state purpose."¹⁰ Therefore, "[b]ecause Act 250's requirements [were] preempted by federal law and do not apply to development undertaken for a federal purpose, the EIS was not required to address Act 250's noise standards." Additionally, because the local land-use controls contained in the Comprehensive Plan were likewise preempted, the EIS was not required to analyze these, although the effects on these areas were considered in the EIS.¹¹

Conclusion

The Court of Appeals for the Second Circuit affirmed the decision of the District of Vermont, holding that the

EIS completed by the Secretary of the Air Force was adequate and did not need to consider the non-environmental impacts of the Secretary's basing decision or the state or local laws that may be relevant.


Suzanne Foote
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Endnotes

1. *Zbitnoff v. James*, 708 F. App'x 25, 26–27 (2d Cir. 2017).
2. *Id.*
3. *Zbitnoff v. James*, 2016 WL 425 1047 at *2 (D. Vt. 2016).
4. *Id.*
5. *Zbitnoff*, 708 F. App'x at 28, 29.
6. *Id.* at 27.
7. *Id.*
8. *Id.* at 28 (quoting *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 772 (1983)).
9. *Zbitnoff*, 708 F. App'x at 28.
10. *Id.* (citing *In re: Request for a Jurisdictional Opinion re: Changes in Physical Structures and Use at Burlington Int'l Airport for F-35*, 117 A.3d 457 (Vt. 2015)).
11. *Zbitnoff*, 708 F. App'x at 29.

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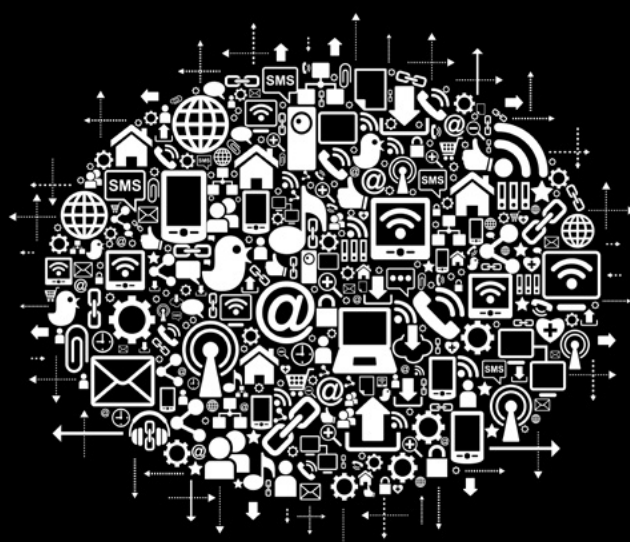
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On Friday, we'll start with a dialogue on the legal and policy framework for the current Administration's repeal of the Clean Water Rule and proposal to re-codify the regulatory text that existed prior to the 2015 rule defining "waters of the United States" or WOTUS. The panel will discuss the status of the definition of WOTUS and EPA's legal rationale and process for repeal. Panelists will provide different perspectives on the repeal of the Clean Water Rule and discuss the implications of WOTUS for the environment and the economy.

The next panel will then attempt to "weed out" the ethical and environmental issues in the budding cannabis industry by exploring issues regarding organic cultivation, pesticide use, and the new/anticipated imposition of restrictions on water and energy use. The panel will also discuss ethical issues in states with medical programs (including New York) and the latest study on legalizing adult use in New York.

Our interactive cocktail hour will be followed by a dynamic dinner discussion by Ramsay Adams, the Founder and Executive Director of Catskill Mountainkeeper.

On Saturday, our morning panel will focus on the legal underpinnings of New York City's multi-faceted program for acquisitions of lands and easements to protect its water supply that serves more than nine million people, the delicate balance between the city's watershed protection goals and community interests in economic development, the role of environmental stakeholders, and developments in the program since it was initiated in 1997 to address flooding events and changing demographics.

This will be followed by a multi-disciplinary panel discussion on legal, regulatory and toxicological issues relating to contamination of water supplies by emerging contaminants such as PFAS and 1,4-dioxane.

Organized afternoon events will include a reservoir biking tour, hiking in the Catskills, and other tours.

Our Sunday morning panel will explore the latest developments from toxic tort litigation involving PFAS, 1,4-dioxane, MTBE and more in New York State and beyond.

More information on speakers, panels and extracurriculars (hiking, biking, reservoir visits, etc.) will be posted soon on Communities, our website (<http://www.nysba.org/ENVIFA18/>) plus on EELS social media.

The Emerson Resort and Spa is a hidden treasure located on the Esopus Creek. Designed with the splendor of the Catskill Mountains and Hudson Valley in mind, open spaces and oversized windows expose stunning views and bring the beauty of the outside in.

Highlights

Friday, Oct. 19:

- Our Clean Water Act / WOTUS Update Panel plus Environmental & Ethics Issues in the Cannabis Industry.

Saturday, Oct. 20:

- New York City's program for acquisition of land and easements; watershed protection issues.
- Interdisciplinary panel on emerging contaminants (including PFAS and 1,4-dioxane) with state and federal regulators.

Sunday, Oct. 21:

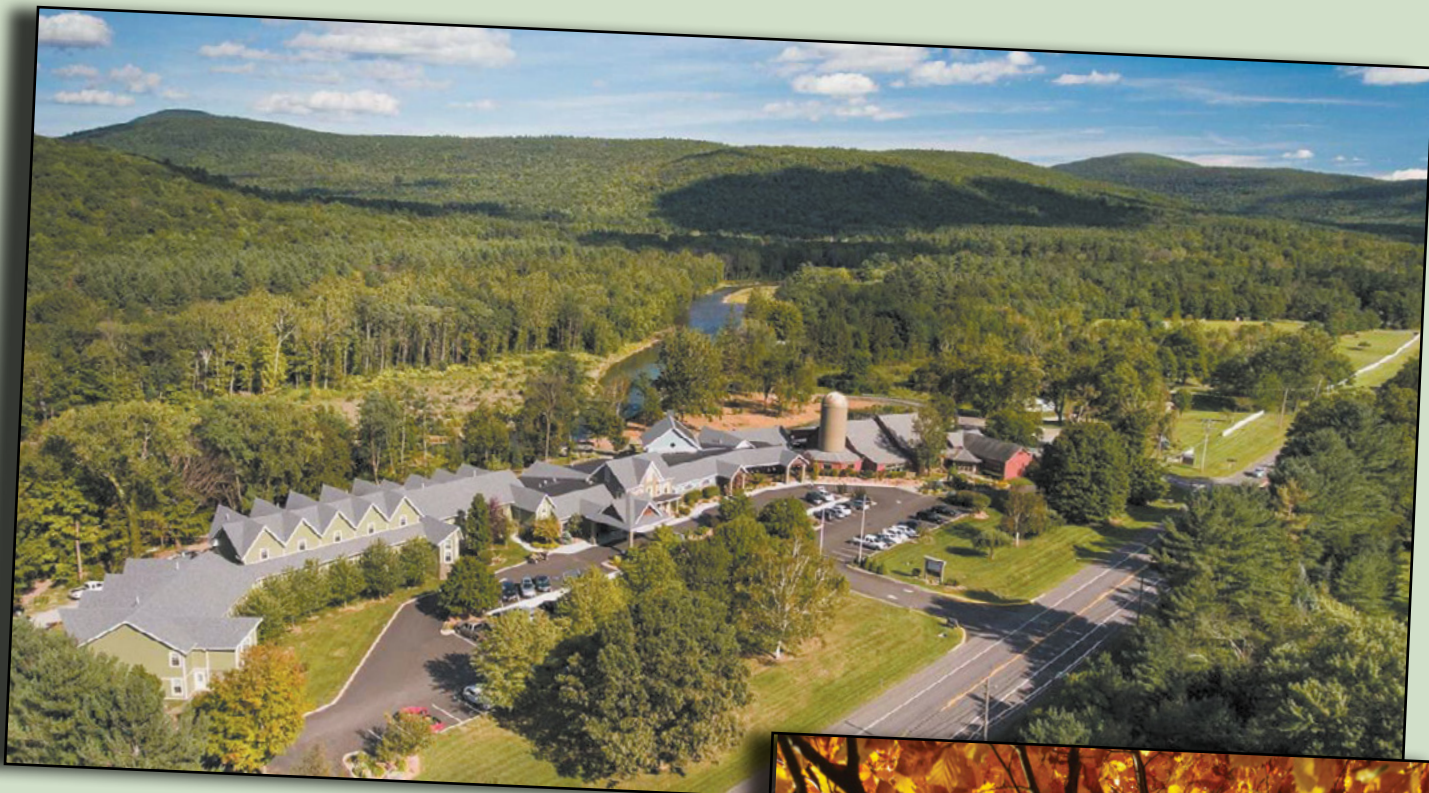
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Check back for further details:
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