VERMONT JOURNAL of ENVIRONMENTAL LAW

Volume 21 ● Issue 3

VERMONT JOURNAL OF ENVIRONMENTAL LAW
VERMONT LAW SCHOOL
Volume 21, Issue 3 Spring 2020

TRANSCRIPTS

ARTICLES

The staff of Volume 21 of the Vermont Journal of Environmental Law *would like to thank Siu Tip Lam, Director of the U.S.-Asia Partnerships for Environmental Law and Associate Professor of Law at Vermont Law School, and her students for their extensive help on production for the article* "Judicial Review on the Validity of Contract Concerning Natural Resources Exploitation and Utilization in Special Regions."

VERMONT JOURNAL OF ENVIRONMENTAL LAW
Vermont Law School
P.O. Box 96
South Royalton, Vermont 05068
(802) 831-1024
vjel@vermontlaw.edu

vjel.vermontlaw.edu

Cite to this *Journal* as: 21 VT. J. ENVTL. L. ___(2020).

The views expressed in this issue are those of the authors and do not represent the position or views of VJEL or Vermont Law School.

Submissions: VJEL welcomes the submission of unsolicited articles, comments, essays, and book reviews. Manuscripts can be submitted to the above addresses.

Subscriptions: You can subscribe directly to our Journal online at vjel.vermontlaw.edu.

Cover Image: "Wind Turbine" by Gonz DDL on Unsplash.

This Journal is available exclusively in electronic format

VERMONT JOURNAL OF ENVIRONMENTAL LAW
VERMONT LAW SCHOOL
Volume 21, Issue 3 Spring 2020

EDITORIAL BOARD 2019–2020

VERMONT LAW SCHOOL'S SIXTH ANNUAL ALUMNI IN ENERGY SYMPOSIUM: SECURING THE FUTURE LOW CARBON GRID

SYMPOSIUM PROCEEDINGS
OCTOBER 17, 2019

BRACEWELL LLP, 2001 M ST NW, WASHINGTON, D.C., 20036

SPONSORED BY THE VERMONT LAW SCHOOL INSTITUTE FOR ENERGY AND THE ENVIRONMENT, BRACEWELL LLP, DC BAR COMMUNITIES, AND PERKINS COIE LLP

INTRODUCTION[1]

Alan Strasser: 00:00:02 Okay. Good afternoon. Welcome to the 6th Annual Energy Symposium reception, here at Bracewell, LLP, in Washington DC.

Alan Strasser: 00:00:11 We titled this program "Securing the Future: Low Carbon Grid", and we're here live. We are also simultaneously webcasting this event. We would ask folks on the phone, please mute your phones to avoid feedback. And I'd like to just give you-simply say that I'm Alan

1. This transcript was created by Rev.com and exported on October 28, 2019. The full transcript can be found at https://www.rev.com/transcript-editor/shared/QrNVy7fcWBpjun0Th-JNn2lcgAqnKRxrCkeFH9-mxR9rB3loxZDATf4tnq226lPgxye3CjDr-uN6eimwuzbMIrSYgWg?loadFrom=DocumentHeaderDeepLink.

Strasser, I'm the DC representative of the Vermont Law School, or as we call it, VLS, Alumni Energy Affinity group.

Alan Strasser: 00:00:43 I'm going to introduce a couple of- acknowledge a couple of people and give an overview of our program in a moment. But before that, I'd like to ask Hans Dyke, of the Bracewell firm, to come up and say a couple of words, and we really appreciate all their help and bringing us together here.

Hans Dyke: 00:01:02 Sure.

Alan Strasser: 00:01:02 Hans...

Hans Dyke: 00:01:03 Thanks, Al.

Hans Dyke: 00:01:06 So, I'm Hans Dyke. I'm an energy infrastructure lawyer in this office, in Washington and Bracewell. We're very, very pleased to have you all back. I think many of you are back for the second time here. We were lucky enough to host for the second time. So, thank you for coming.

Hans Dyke: 00:01:23 So, logistically, if you all need anything, Julia, is here...just excellent on anything technology related, if you have a technology problem. I need to mention the bathrooms, they are that way. So, walk around either left and right you'll hit them. But-to get that out of the way. Thank you all very much.

Hans Dyke: 00:01:39 Bracewell is... A little bit about Bracewell. We are [inaudible 00:01:43]firm [inaudible 00:01:44] in energy infrastructure, environmental, all the stuff that goes along with that. Energy really is in our DNA.

Hans Dyke: 00:01:51 We're not all things to all people, and we don't try to be. But we do energy deals, and energy work, and environmental work, and everything that goes along with that, all around the world from our offices here, Houston, London, and Dubai. So, that's who we are and sort of what we do.

Hans Dyke: 00:02:06 In particular, my practice is all transactional. We'll do solar deals, wind deals, gas, fire deals. So, if there's anything sort of in this

space, a lot of upstream oil and gas, midstream, downstream. But that's what we do.

Hans Dyke: 00:02:19 Our tax lawyers, our real estate lawyers, our energy lawyers, our benefits and labor lawyers, our energy lawyers. So, when you come here, and you're at Bracewell, and you are doing energy deals or energy litigation, you don't have to educate your colleagues, who are specialists in certain areas, or your deal lawyers that are-we all do the same thing. So, it's a great place to be for people who are in the energy space.

Hans Dyke: 00:02:41 Anyway, Jason Hutt cannot be here. He is...I think most of you all, I think are Vermont Law School grads and you probably all know Jason...He seems to know all of the Vermont law school grads I've met in my career. But Jason has sent his apologies. He's on a plane back from-

Alan Strasser: 00:02:56 either South Dakota or I think he went from-

Hans Dyke: 00:02:59 somewhere in Texas to somewhere north of Texas, and now he's on his way back and he will be at our reception this evening. But he wanted us to mention this. So,

Hans Dyke: 00:03:14 So, with that, let us know if you need anything either Julia, myself, Josh Robichaud, who is one of our attorneys here and he can lend his perspective on I think the first panel that y'all have.

Hans Dyke: 00:03:26 So, I'll get out of the way. Let us know if you need anything, but welcome and thanks for coming. So, I don't think-

Alan Strasser: 00:03:38 Thanks, Hans. Bracewell's been a great partner. They're in the facility, they're hosting the events, they've done it before. Jason Hutt is in a really committed [inaudible 00:03:48].

Alan Strasser: 00:03:48 So, I wanted to very quickly give an overview of the program, acknowledge, and thank some folks. I'll give you a quick history, and we'll get right into the program, and stay on time.

Alan Strasser: 00:03:56 The other sponsors are, besides the VLS Alumni Energy Affinity group, are the EDLS Institute for Energy and the Environment. Also, Perkins Coie, as well as the DC Bar Energy Environment and Natural Resources community.

Alan Strasser: 00:04:13 So, welcome to our community where we bring lots of people together, not just to make you feel less alone. The overview program is pretty quick. We have three panels, we have a Keynote, and then we have a reception starting at 5:45. All that's on the website and some materials in front.

Alan Strasser: 00:04:31 There's a little pamphlet floating around that has information about the speakers.

Alan Strasser: 00:04:37 The first two panels will look at in increased electrification, a transition to a lower, greener-a lower carbon greener grid, featuring natural gas and grid scale solar is two of the topics on that agenda. And then moving on into the third agenda is about cyber security, and then after those three panels, Governor Tom Ridge, now from Protect our Power, formerly from the of Pennsylvania, will be speaking our Keynote at 5:40, at 5:45 is a reception.

Alan Strasser: 00:05:14 And also, I'd like to, in addition to our sponsors, thank several really important people for making this event happen, year after year. As anyone knows who's done in an event like this, there's a lot of detail, they're not huge profit-making centers. We try to raise enough money to pay for the good drinks, and hors d'oeuvres, and happy hour, basically.

Alan Strasser: 00:05:35 The first people we'd like to mention are Melissa Hardwood, who's our Alumni Relations Director. If she would rise or wave her hand. She's done an incredible amount of work for us.

Alan Strasser: 00:05:46 And Kevin Jones, who's Director of our Institute, our Energy Environment Institute,

and his staff. If they would please rise and acknowledge who they are. They do a ton of work for us across the country in terms of progress and thank you so much, again, for your leadership there.

Alan Strasser: 00:06:13 So, in addition to that, a very, very quick note from Dean McHenry, who, from the Vermont Law School. Dean, who has attended for the last two years but could not join us because he's traveling to China to work with some partners there, but he could not make it, unfortunately. And in addition to that, I'd just like to tell you very briefly about the history of this event. The full history, if you really want to see it, is linked to our website. But it's interesting, it tells you something about the Vermont Law family.

Alan Strasser: 00:06:45 Dan Phillips, he's not here, he's an alumni, had this idea of working with the alumni that are in the emerging energy field several years ago. And he wrote to the Dean and said, "I really think we need to create a forum to exchange ideas, research, and business opportunities."

Alan Strasser: 00:07:02 And the Dean said, that's a great idea. So, in a meeting that was hosted in part by Dr. Kevin Jones and others at DLS, a bunch of people came together, alumni and said, this is a great idea. One of the outcomes was how about when we create a symposium and bringing a bunch of smart people together, that either are Vermont Law grads or are our friends and colleagues. And so that was done several years ago, and now we're on our 6th annual event. We again, are trying to raise intellectual capital in the energy environment fields. There's a couple of things we've done that I think are important. From a substance standpoint, this article talks about all the-some of the people-that we've had on these panels and it's also on our website as well. We

brought together thought leaders and a candid forum to discuss really important issues.

Alan Strasser: 00:07:55 And they range from the clean power plan, to Puerto Rico's energy crisis, to all kinds of renewable energy issues, grid modernization, role of RTOs and ISOs, EDs, et cetera.

Alan Strasser: 00:08:07 So, we've done that in a respectful way. We always try to bring together the private sector with NGOs, with state, federal and local partners as well. And, we have also tried to capture a lot of this information. If you're ever interested in, and you're doing some research, you can go to the Vermont Journal of Environmental Law, or all the symposiums [inaudible 00:08:27] that they captured. And we also have tried to be a little more cutting edge, so we need to try to webcast this event, capture the event.

Alan Strasser: 00:08:35 And, we had last year, "Current Revolution", a movie about grid modernization. We had a person do the premiere, a sneak preview here. And so, we, again, these are people from outside our community. We brought them in our community to enrich the experience that we have here from the symposium. So, I want to thank everyone who's here today, all that support behind the scenes, that come to these events. We look forward to a great dialogue. And with that, we're going to start Panel number one, whenever they're ready to kick off the substantive program.

Alan Strasser: 00:09:09 Thank you, very much.

PANEL ONE: THE ROLE OF NATURAL GAS IN A 100% CLEAN POWER SECTOR

Kevin Jones: 00:09:19 Good afternoon.

Kevin Jones: 00:09:20 So, the first thing you'll note is I'm not Samantha Williams, I'm Kevin Jones, a director of Institute for Energy and the Environment, and I'm standing in for Samantha.

Kevin Jones: 00:09:28 Samantha is one of our extraordinary alum. And she's the Midwest Regional Director for Climate and Clean Energy for NRDC and works out of Chicago. There's probably- shortly after we had our last symposium that I reached out to Samantha and tried to talk her into moderating a panel. And she had been working on that diligently from that time. We recruited this wonderful panel here, and I think it was Monday afternoon, as I was just returning home from a long week of travel, I get a text. A very, blunt and clear text from Samantha, as I've come to communicate. It was: Broken arm. DC is up in the air. And unfortunately, Samantha had a little accident, broke her arm early in the week. And her first response, being the person that she is, the only, she just, "Oh, I think I'll make it. You know, don't worry about it."

Kevin Jones: 00:10:20 And I'm thinking, "What?" Travel, air travel, these days is tough enough as it is without doing that after having just a broken your arm. But Samantha decided it was best not to travel. So, I'm here for her. And I just want to thank her and let her know we're reserving a spot on the panel next year for her for a moderator, you know, under better circumstances.

Kevin Jones: 00:10:41 So our panel today, that Samantha has put together, is on the role of natural gas, and 100% clean power sector. And I'm just going to introduce the three panelists in just- with some of the background that Samantha gave me- just to introduce the topic a little bit.

Kevin Jones: 00:10:59 So, today we have with us Mike O'Boyle, who's the Director of Policy and-oh-Director of Electricity Policy for Energy Innovation. And Mike and I actually met last night for the first time, at the reception for Energy Bar Association, had an engaging conversation, so we're really looking forward to his presentation today.

Kevin Jones: 00:11:17 We also have with us, at other end, Kim Smaczniak, who's a managing attorney with... For the clean energy program with Earthjustice, and Kim's going to share her thoughts on this transition.

Kevin Jones: 00:11:29 And finally, we have Josh Robichaud, who's an associate here with Bracewell with us today.

Kevin Jones: 00:11:36 In terms of when Samantha was thinking about this, she really thought this would be a timely talking with all the 100% clean energy commitments that are showing up across the U.S. 15 to 20 States that have put out deep de-carbonation power sector goals.

Kevin Jones: 00:11:54 Nearly 30 utilities, themselves, that have come up with their own deep de carbonation commitments, at least 80% CO2 reduction by 2050, or earlier.

Kevin Jones: 00:12:03 And the amazing leadership that some of our cities are showing. Sierra Club counts over a hundred cities with specific 100% renewable energy commitments.

Kevin Jones: 00:12:13 And obviously with the urgency of the climate crisis and these clean energy commitments, one of the things that has been greater focus on, is really the role of natural gas in that transition. Clearly, natural gas has played a significant role in terms of cheap natural gas prices, really doing a lot to actually drive a lot of coal fire generation out of that- out of the market due to the economics. And obviously, they've been a part of this transition.

Kevin Jones: 00:12:46 But I think the question our panelists are going to talk a little bit about today is: what is their role and what is that transition going to be like as we try to quickly move now to 100% clean power commitments?

Kevin Jones: 00:12:57 And I'll turn it over to Mike to kick things off.

Mike O'Boyle: 00:13:01 Great. Thanks, Kevin. Everyone can hear me just fine? Any for amplification? Okay.

Mike O'Boyle: 00:13:07 So as Kevin said, I'm the director of Electricity Policy of Energy Innovation. We're a small team in San Francisco that does research and promotes policies that can drive de-carbonization, sort of at scale, and speed, at the lowest cost possible. And part of that work is our energy policy simulator. We have a modeling team that has created a model that I encourage you all to go online, there's a web app tool and play with it. It allows you to, sort of pick your own policies and see what the impact on emissions is, out to 2050. And one of the things that they did recently was update the model with new policies that allow the emissions curve to bend all the way to net zero emissions by 2050. So, in earlier iterations of the model, there was not enough industrial policies. That's a really difficult sector to decarbonize. So, they, they sort of created a hydrogen economy to make that possible, which is, you know, that's one pathway, right?

Mike O'Boyle: 00:14:12 But, I encourage you to go on that, and that's sort of where I'm going to start with the presentation today about the future of natural gas in a low carbon future. And yes, I did put a provocative unfinished bridge up there. You know, natural gas was often seen as a bridge fuel. But my argument today is that, starting now, along the timelines that we've got to get to zero by 2050 in many of these States, new natural gas simply doesn't fit.

Mike O'Boyle: 00:14:45 In this economy wide net zero scenario, the black line that you see here represents business as usual under current policy, and the blue line represents the net zero scenario. And that's the volume of natural gas consumed in the United States. To get to net zero emissions, you really need to get natural gas consumptions declining almost immediately to have a reasonable chance of achieving that goal. And that's just sort of how the, how the pieces fit together.

Mike O'Boyle: 00:15:17 So, I'm going to talk about, just briefly, what I think we need to look at in the near term, in the medium term, and the long term, for the future of natural gas in the electricity sector.

Mike O'Boyle: 00:15:29 So, in the near term, the main goal, I think, needs to be to limit the expansion of the natural gas system. So as Kevin noted, and many utilities are now adopting voluntary, 100% clean by 2050 standards. And, you know, that's 30 years from now. Natural gas power plants last 25 to 30 years. They actually have an accounting life that is anywhere from 20 to 30 years. And the graph here goes in red- if you annualized the capital payments on those assets, it's indexed to a 30-year timeline. And the longer, sort of the later, you build a new natural gas plant, the higher the annual capital costs are associated with that plant.

Mike O'Boyle: 00:16:14 And as you can see, by 2030 you're talking about a 50% increase in the annual capital cost of these plants. And that continues to rise as you get closer to 2050. So, I'll also-we're not going to dig into cost now, but there are a lot of alternatives to natural gas. Solar plus storage, in particular, [is] becoming really economic alternative to providing, you know, peaking flexible capacity. That's zero carbon and those options are really increasing.

Mike O'Boyle: 00:16:47 But I think avoiding the hidden costs is really important, later, associated with that natural gas infrastructure and avoiding the build out of that now is advisable.

Mike O'Boyle: 00:16:58 Natural gas pipelines last 60 or more years, and we spend about $10 billion annually in cap ex, and most of that is for the distribution system. About two or three billion is for the bulk transmission of natural gas.

Mike O'Boyle: 00:17:13 If you do that same math of accelerating the retirement of those assets to 2050, you can see, if you use the 60-year timeline, you have that green line of sort of annual costs. And that rapidly increases if you set the retirement date

at 2050. And I think avoiding, again, the sort of potentially stranded assets, or at least pricing in the faster depreciation timelines, is really important to having transparency around what is the cost of continuing to build out natural gas infrastructure and what are we going to pay for it later if we don't, or if we do.

Mike O'Boyle: 00:17:53 So, in the medium term, I think we're definitely going to need to use the existing gas capacity that we've got, for flexibility, in conjunction with these other technologies. So, the key question is, how can we manage and pay for the pieces of the existing fleet that we need?

Mike O'Boyle: 00:18:11 I mean, we have 450 gigawatts of natural gas capacity in the U.S, 80 gigawatts of hydro. And how do we manage that to minimize costs, and actually use those economically, where feasible, but minimize the amount of energy we use, natural gas we burn, in managing that?

Mike O'Boyle: 00:18:31 So, the gas fleet and the hydro fleet are well positioned to provide a lot of the flexibility that we need to help integrate more and more variable renewables. But I'll also note that energy storage has a huge role to play as does increasing the linkages between regions, through improving grid infrastructure, and transmission, access to renewable energy.

Mike O'Boyle: 00:18:56 The demand side has huge untapped potential, particularly demand response to [kind] of use rates, to ship demand in response to the availability of renewables and reduce the need for peaking capacity, and also, some of the operations in the market.

Mike O'Boyle: 00:19:15 People that on the phone, listening in, put your cells on mute, please. We're hearing you.

Mike O'Boyle: 00:19:26 Yeah, yeah. A lot of paper shuffling over there. Okay. So, in the long term, what, sort of the state-of-the-art power system modeling shows is that, we don't have a ready substitute

right now with existing technology, to provide the long term storage or to provide energy during long periods of where we have low solar output, and low wind output, which can actually happen for a week at a time. And so, natural gas, right now, will be probably the main source of energy during those times, that we've got. And until we have a replacement for that, it's not really, advisable to sort of get rid of all natural gas. And so, the top line, I think, is that we need to pull resources and create market mechanisms that drive technological solutions to that problem, and sort of create carrots for industry and public private partnerships that creates those solutions.

Mike O'Boyle: 00:20:31 So, I think other questions that we need to answer: What are the most valuable applications for the limited, renewable gas supply that we have? Either from waste or from biomass? You know, how distributed must, or will, our electricity system become, is an open question. It's going to go different ways in different places, but it really impacts what, how the bulk system will evolve.

Mike O'Boyle: 00:20:59 I think with increasing resilience concerns, especially like in my home state of California, it's really important to consider how much local resources is going to meet a lot of that need, and how does that change the role of natural gas, that's to be determined.

Mike O'Boyle: 00:21:15 What are the sources of long-term storage that can scale? There are some promising technologies. I think carbon capture and storage technology could mature and play a large role. Right now, the demonstration projects we have are a little bit more limited in how promising they are. But I'm open to more scaling of that.

Mike O'Boyle: 00:21:34 And will next generation nuclear also become a resource that we can use? These are really uncertain things. But really, as you look

out to the future, these are the main questions that I think we need to address in the long term.

Mike O'Boyle: 00:21:50 So, I hope that gives you a frame for the rest of the discussion, and there's a lot to talk about. But I think I'll end there.

Kevin Jones: 00:22:02 Thanks, Mike. We'll do questions at the end. And I think the order is-Kim are you-

Kim Smaczniak: 00:22:04 Great. And just to let you all know, I'm from Earthjustice and Earthjustice is much like a law firm, but we do pro bono work on behalf of environmental groups and community groups. And so, our perspective on this topic is very much informed by our representational capacity. The folks that we represent are often the folks who have been most harmed by the fossil fuel economy. Environmental justice communities who have longed faced the harms of a fossil fuel economy. And, the other component of what drives us, in our answering where is the role for natural gas, is fundamentally the science around climate change. So, also an organization that puts climate objectives, which are fundamentally human rights issue, at the center of our work. So, just a reminder, and this is something that Mike touched upon, one of the things that really drives this question around gas, what it has to be, is the science around climate change.

Kim Smaczniak: 00:22:57 So, what do we know about when we need to get carbon neutral? The UNF Triple C, you know the world's best scientists on climate change, issued a 1.5-degree global warming report this past year. And it showed us that dramatic emissions reductions are needed if we're going to avoid the most tremendously harmful impacts of climate change and avoid the worst of what comes from two degrees, three degrees or you know, God help us, four degrees warming.

Kim Smaczniak: 00:23:25 And the upshot of report is that we can still achieve that. But what we need to do that, is globally, not just in the U.S., but globally, reach net zero by mid-century. 2050, net zero. Now that net zero is not just a power sector. That is across all sectors. That means land use, agriculture, very difficult sectors to get at.

Kim Smaczniak: 00:23:45 It means transportation. And so, if you back up from that, is what we need to achieve by 2050, you must have a decarbonized power sector. Because you cannot drive the emissions reductions that we need, you cannot unlock those emissions in the transport sector and other areas of the economy, without first having the power sector.

Kim Smaczniak: 00:24:06 And so, this question of what is the right role for natural gas cannot be discussed without keeping that as your North star. Those are the things that we need to achieve in order to avoid the very human, very real sacrifices that come from greater degrees of warming. And just to be frank about it, our house is on fire. We've heard Greta Thunberg talk about it that way. This is true. We've let it burn too long, and we've lost some of the ability to control intellect for the most elegant solutions. We have to stop the fire, and we have to act with urgency.

Kim Smaczniak: 00:24:39 And so, we're not always going to be choosing the optimal solution. Had we started work on this problem 50 years ago. We are going to have to be acting with the reality of the science.

Kim Smaczniak: 00:24:48 So that's my North star in this conversation, and gives us to the answer that we have to, as an organization, our position has been, and we advocate in the proceedings we're involved in, we have to stop building new natural gas, period. It has to stop. And then move as rapidly as possible, acknowledging what Mike has described as the tradeoffs of rapid removal of existing gas plants. Well, the goal

has to be to eliminate that as quickly as possible. We cannot achieve our de carbonization goals, including in other sectors, until we do that. So that's my answer on the question.

Kim Smaczniak: 00:25:26 But let me get to what I really fundamentally want to focus to in my remarks, which is that, the area that I work in largely has been in regulated energy markets. The markets that are subject to FERC regulation. The power markets that really matter to whether or not we're going to be able to stop gas build out.

Kim Smaczniak: 00:25:48 So, this is particularly true if you look at the deregulated Northeast RTO, you look at [inaudible 00:25:54] if you look at ISO New England, and you look at, particularly PJM, which is the largest RTO. It had served some 65 million customers. There is a huge amount, if you looked at 2018 figures, a huge amount of planned gas, fast city growth. Thirty percent of what's projected to happen in terms of additions of gas capacity, is in those deregulated markets.

Kim Smaczniak: 00:26:18 Now, part of that driving might be the Marcellus shale, very proximate- Pennsylvania, Ohio, really big potential areas for planned growth.

Kim Smaczniak: 00:26:27 But the bottom line is that you cannot get to the goal of decarbonizing the power sector. You cannot achieve those 100% clean energy goals, which are largely in Eastern States, not all of them, but a lot of them, while we have the existing set of market rules.

Kim Smaczniak: 00:26:42 So that is really the focus of what I want to talk about, is the fact that these rules that we have in these regional markets are a part of what is majorly driving this gas build-out, and are a major barrier to be able to achieve those 100% clean energy goals. And we cannot get to 100%, we cannot get to the tough 10% last emissions reduction solutions, until we get to the heavy work of the 40%, 50%, 60%

reductions that only entails achievable in the technology we have today, but is not possible, it's not going to happen on its own, in these markets without changing some of the assumptions that are buried in these rules. So, I- these are complicated sets of rules, like to really dig in and lay out some of what's stacked into those outcomes, the build out that we're seeing in these markets. It would take a lot of in-depth conversation.

Kim Smaczniak: 00:27:35 I'm just going to set the stage, give an example. Give an example of a reason to be optimistic about the direction we could go and then leave a lot to the discussion. So, I'm going to have to, by nature of the time we have, keep it a little bit high level, but happy to dive in deep. Particularly for folks who may be more in the weeds of some of these RTO details.

Kim Smaczniak: 00:27:53 But, just to really flag the scale that we're talking about. So, in that PJM market, the 2118 projections of how much proposed gas build we have, is 40 gigawatts. Now, I suspect some of that 40-gigawatt proposal, proposed build out, may not get built. You know those are looking at what investors think they might be able to make money on. Not all of those pan out. But if you look at those numbers, what we're seeing in PJM is basically the gas- or the coal retirements that we've seen being driven- are all being replaced by gas.

Kim Smaczniak: 00:28:26 And so, we will have a gas dominant system. That is not going to reach your zero-carbon goals. There's no way you can get to those deep cuts in emissions if that's the outcome we're dealing with.

Kim Smaczniak: 00:28:39 So, now if we know renewables are getting cheaper and cheaper and ostensibly, this is a market in which economics should drive outcomes, why do we see this huge glut of proposed gas build? And why do I say that

these outcomes are baked into the market design?

Kim Smaczniak: 00:28:56 So let me turn to what I'll call exhibit A, which is capacity market design. And particularly PJMs capacity market design. And, as a reminder of past the market is the reliability mechanisms, the goal of which is to ensure that you have enough capacity on the system looking forward, MPJ was a three year ahead. Looking ahead, what do we think we're going to need, you know, in order to make sure we meet all of the system needs, plus some contingency, some unexpected event, and make sure that gets built.

Kim Smaczniak: 00:29:26 And so, it's a constructed demand curve, and we're going to pay out certain payments in advance to ensure that if we're having some gap between what we need and what we expect we're going to need, that there- that payments go out to incentivize to build out we're going to need.

Kim Smaczniak: 00:29:39 That's basically the how the mechanism works. Whole of detail that's being smoothed out under there. But the gist of it is that. And so, any PGM market watcher will tell you that current capacity market is currently a mess. The auction literally hasn't been able to be held over the past year because there's currently ongoing FERC proceeding. There's a big thicket of a fight around the extent to which PGM can push out certain resources. Specifically, nuclear plants and renewables, that are beneficiaries of state policy. And so, if for example, a renewable development project is a beneficiary of a renewable portfolio standard, the question is, can that development project effectively be pushed out of the capacity market, not be able to benefit from that revenue because of that state policy.

Kim Smaczniak: 00:30:32 Now because it's a politically contentious issue, it's been stuck, it's been on hold. There hasn't been a final decision about what will

come from that. PGM's proposed a set of rules that would push out those resources. FERC is in the process considering what does it think is an acceptable solution in response to PGMs proposal. So, you know, the entire market now is kind of in a confusion, because a lot of participants don't even know what the rules will be that will apply going forward. But- and that's a particularly important piece of a problem there. We have these questions over whether state policies are going to be allowed to influence the market outcomes. But even setting that aside, setting aside this very obvious and very difficult set of rule changes that are currently in flux, there are components of the market design itself more fundamental in this very recent set of policy reforms that are at issue. So at the basic mechanism, the most basic level, the capacity market was designed around an assumption that, to ensure the system operates reliably, you really need enough of a certain kind of large traditional fuel dependent generator, that's going to be built and available to operate for fixed stretch of time for as long as is needed during disruptive events. So, it's fundamentally built into the assumptions of what we want the capacity market to deliver is at its center, this idea of using traditional generators, right?

Kim Smaczniak: 00:32:10 So, it's really built around the financial model of a traditional generating plant. It doesn't count capacity that comes from resources that don't operate like a traditional plant. That operates only during part of the season. If it operates during- if it operates like a renewable energy resource where there's intermittency and when it can be available. If it can't come when it's called, to run for a particular amount of hours, it either doesn't count at all or it gets discounted. So, baked in the rules of the system.

Kim Smaczniak: 00:32:42 It's also the capacity market administrative mechanism that's heavily biased toward extra caution. It's got layers of added stat to the system to make sure we really avoid those adverse outcomes. And so, you have every piece of a capacity market. It's a load forecast looking three years ahead. It's an expectation about the degree that resources are going to be available to perform. It's an expectation around what the system will look like in the future. And all of it has margins of error, and all of it has to be built around a set of assumptions. And the tendency is going to be, because the market operators job is to deliver, you know, reliability and avoidance of risks, it's going to be to try to make things conservatively and build up layers of extra capacity. Which means building out extra power plants that we may or may not need, if we're wrong about those assumptions.

Kim Smaczniak: 00:33:34 So, what I'm telling you is everything about how you've built the system is getting in the way of our ability to have a sleeker system that's going to emit lower emissions, and it's built towards a particular type of resource that has particular sets of risks and financial needs in order to get built. Foundational to what we're building in PJM.

Kim Smaczniak: 00:33:54 Cannot get to where we want to go unless we change some of these rules. So, I don't think you need to assume that I'm correct on this. These are all things, points have been laid out by experts who are much smarter than I am, and it's really told in the numbers. So, just to point to a couple of quick resources, we can talk about these later, but there's a fantastic paper called Asymmetric Risk and Fuel Neutrality in Capacity Markets written by PhD economists. Including one who is the chief economist at Burke, on that's Jacob Mays, David Morton, and Richard O'Neill. And the upshot is essentially what I described

earlier: that the capacity market is built to address particular types of financial risks. It's a great hedge if you look like the traditional fossil fuel generator, where you have a set amount of fixed costs, and then a large amount of operating costs. Looks does not work well at all, in terms of hedging risk for something that looks like a renewable development project.

Kim Smaczniak: 00:34:49 Fundamentally different kind of financing needs, and the capacity market doesn't help you to cover your financial risks if you're an investor thinking about making that bet. So, really fundamentally, again, baked into the design problems with the system we've got. The FERC itself has opened up a seasonal capacity market docket. We're looking at the fact that PJM, the way its capacity market is structured, is biasing against certain types of resources that are only available in one season. They're perfectly good. If they're good during the season when you have your peak, why shouldn't we count those? FERC's looking into it. FERC agrees. This is something that makes you scratch your head. Another example of just in the data, the fact that the capacity market is very conservative. What are PJM's target reserve margins? They're about maybe 15 to 16%. They say we need this amount.

Kim Smaczniak: 00:35:41 What does it actually end up getting in the market? What it goes for, it in terms of clearing the market? It's more like 16 to 23%. Okay? So, way above what it says it needs. Okay, on top of that, when you look at what actually ends up being the correct forecast. When you account for the errors in low forecasts. We said we saw we're going to need this much, but then when we look back, we actually need less. We're actually getting close to 30% that we're purchasing

Kim Smaczniak: 00:36:22 So, I mean the scale of the errors in these things matter. Recently, PJM just corrected its load forecast. Very minor change. Very minor, in terms of it's not a grand sweeping thing that had to go through a FERC proceeding and was contested. 3.5 gigawatts change in how much it's going to be developed in the next capacity market auctions, because it made a tweak in its forecast.

Kim Smaczniak: 00:36:44 So these assumptions that are built in these models, have huge impacts on the ground, in terms of emissions. So, I think I'm running out of time a bit, so I'm going to not get into any other examples of that. But I want to just say one thing, about a reason to be optimistic about the future. And that is order 841, which is the storage orders that FERC recently put out, and is now in the DC circuit. It's been subject to challenge, but is really a landmark change in direction. So, why is this so such a landmark approach for FERC? Here to now, we've really had systems that were built around this is what a traditional generating model looks like. And everything has to fit. If you're a circle, you have to fit in a square peg, doesn't matter. We're going to try to see, and account for you, as if you should've been a traditional generating model.

Kim Smaczniak: 00:37:33 Storage forces them to change those underlying assumptions. Storage we know has so many different ways. It is both. It can take in energy, it can inject energy into the system, so it looks like demand. It looks like supply. It is able to act like transmission, in that, it can avoid the ability to have to have build-out transmission, where there's transmission constraints. At the same time, it looks like a generator. So, it crosses boundaries in a way that forces us to rethink the model. And the amazing thing is, that in spite of the fact that we have many

challenging politics in the energy world right now, order 841 came out. And the participation model that they set out, which says we have to look at what storage capabilities are uniquely and differently, is a huge trend. Important marker for change in a trend. If this starts to happen in other areas, we start to really looking, and say, "What is the capability of this resource, and how does it help serve our actual needs?" Instead of trying to use the existing assumptions. That will mean that we can really change the system overall, and start to use a whole slew of other technological capabilities that we will need to tap, to get our clean energy goals. So, I'll stop there.

Kevin Jones: 00:38:43 Thank you Kim. And we'll finish up the panel with Josh.

Josh Robichaud: 00:38:48 Thank you. And once again, everyone, welcome to Bracewell. We're happy to have you for the second year. I start with the standard disclaimer. The views expressed are my own, not necessarily those of Bracewell, or our clients. But I wanted to draw on, it was touched on in each presentation, and I want to push it a little more at the forefront here, being the reliability and resiliency pieces of this. Not to say that emissions are not a major factor, and a major element in the picture that we're painting here. It's that these other two, being reliability and resiliency, are another point to balance all of this across. Hopefully, the Interstate Natural Gas Association of America, INGAA, as you may have heard it referred, put together a report earlier this year, which released in May, that looked at exactly this question. What is the role of natural gas, as we moved towards more de-carbonization?

Josh Robichaud: 00:39:41 They studied the role of natural gas on a 20-year timescale, so from 2020 through 2040, what is that going to look like? And they do it through two scenarios. One being a balanced

approach, not necessarily business as usual, but sort of operating under the same assumptions, and build, and development, and growth that we have right now. And then also under a prioritized renewables, or rapid renewables, approach, which had states meeting 50% renewables by 2040, had nuclear being extended, and continuing to run. Even though, the economics may not be there. Sort of the best-case scenario assumptions to get to those end results. In the balanced approach scenario, there was slight growth. Sort of, was able to continue operating. There was still a role for natural gas to play in that scenario.

Josh Robichaud: 00:40:31 On the prioritized renewables approach, it was more or less constant from where we are now. And that more or less, tracks with what we were saying. Trying to dip off or further reduce emissions, but that is to say that there would still be a role for natural gas, even in the best-case scenario with build-out of renewables, and the other constituent factors that could impact that at a house. That is because we need natural gas in order to have the renewable penetration that we want. Just off the east coast of the U.S., 19,000

Josh Robichaud: 00:41:09 The more that we want those intermittent resources on the grid, which has emissions benefits, which has in some cases, cost benefits. If we want to be able to integrate those at that scale, you need a resource that can ramp quickly. That can respond to the intermittency of those resources. And right now, that is natural gas that can provide that at a cost that is reasonable and is something that we can work with. And that cost part, is not an insignificant factor in this. That if we want to have resiliency, at the same time, any sort of increase in these costs, whether it be from stranded assets, whether it be from further renewables, or more expensive

resources coming onto the grid, those increases in cost are going to hit low income customers, low income rate payers first.

Josh Robichaud: 00:41:56 And same thing. We have emissions concerns; we have other policy things to balance against. But that is going to be one of the more immediate, and first concerns from policy perspective. But more importantly before the state regulatory commissions, and the federal energy regulatory commission, for that matter, they are rate regulators, at bottom. So, they want to be concerned, and focused on those things. So, all that is to say, there is a role for renewables going forward, and we want to, excuse me, a role for natural gas going forward, in coordination with renewables. The National Bureau of Economic Research in 2016, did a study of this balance between the two. A 1% increase in fast reacting fossil generation, is associated with a 0.88% increase in renewables. So very much a complimentary. They explicitly state that in their conclusions. There is a highly complementary—that they should be jointly utilized, to meet the goals of cutting emissions, and ensuring a stable supply.

Josh Robichaud: 00:42:56 So that sort of is the reliability piece, and wrapped up within that, some of the economic concerns. I have a little bit on battery storage, but I know that we may have some questions around that, so I don't want to step on toes there. I just want to set the table in one quick way with that. If we want to talk about energy storage as filling the same role or being the functional equivalent of a natural gas resource, I think there is a path for energy storage to play that role, but it is not currently there. The issue mostly being the duration with which energy storage can provide output. Right now, that is anywhere from a half-hour up to about four hours. But if we're talking about, in California for example, or anywhere

where we have a mismatch, an intraday, or seasonal misalignment, that four hours isn't enough to cover what we would need through that whole period.

Josh Robichaud: 00:43:50 So, you need a natural gas or something like that, that has a constant feed stock that is able to continue to run, even past that period. That said, there is great efficiencies to be gained from partnering energy storage with a natural gas resource, and we'll get to that in a second. That is some of the more recent proposed natural gas build out, is using that sort of synergy. But it's just to say that, there is a role for battery storage, but right now those are in a one for one functional equivalent of each other, setting aside the cost concerns. So then taking the long-term approaches, as Mike posed it. Well when we're thinking about the different ways that natural gas can integrate into the system. A couple of examples for you. Buc-ee's. Think Wawa, or a Cumberland Farms, a convenience store mostly out of Texas. Very large if you've ever seen them.

Josh Robichaud: 00:44:45 Like most things in Texas, very large. A gas station, convenience store, truck stop. I think there's carwash. There's several of these built out across the state. They have partnered, and finance a series of small natural gas generators, that are able to island their facility off of the grid, and run independently of any other power outage, or anything else going on around it. So, Buc-ee's, is seeing this as, from a commercial perspective, we can continue to run no matter what goes on around us and continue to provide this value to our customers. But in a dire emergency situation, we can provide the critical fuel, food. In many cases, some emergency responders can set up on their facilities, to be able to continue to run through this period. That's because of the flexibility and reliability you can get out of a small, modular natural gas turbine. H-E-B,

another grocery store doing similar things, similar reasons, providing it in those ways.

Josh Robichaud: 00:45:45 Just north of here, in Baltimore, there had been several public-purpose micro grid projects proposed, to interconnect several different companies. So, these public purpose micro grids, would be linking several different—so, option, nonetheless.

Josh Robichaud: 00:46:23 The last example I want to talk about, is in Long Beach, California, Southern California. Edison is building a new natural gas plant, or updating a natural gas plant. They are partnering that with a battery storage array. And that battery storage array, the intent is, to allow the natural gas generator to run at a consistent rate. And have the battery storage array, be able to do any of the step up or step down, that would be called upon for the generator. And from an operational perspective, this is better for the natural gas generator, because it avoids any maintenance or operational concerns that comes from ramping up or ramping down making those adjustments.

Josh Robichaud: 00:47:03 You have the battery providing that slack, and it's able to respond while you can run the generator at a consistent rate. At the same time, you also have emissions benefits from that. Running at that consistent rate, you're able to plan for it, for one, and you don't have those sort of residual problems when you're pushing up and down. And AES, one of the companies building it, explicitly said that we're building this now, and it's providing flexibility to allow this to be a platform for other things.

Josh Robichaud: 00:47:32 Their building partially, partially building out this battery storage array. There is space and opportunity to build that even larger, where the battery storage array can become sort of the primary generator, and the natural gas turbine just as backup, or complimenting that.

So, it provides flexibility, it provides different options. Not only for battery storage, but for other types of resources to integrate into that. So, all of that is to say, that there is a place for natural gas going forward. And in order to make the map work on that, and from a reliability perspective, and an emissions perspective, I don't think anyone can say there's one way forward, but there are options.

Kevin Jones: 00:48:14 All right, thanks Josh. And panelists have left us with about a half hour for questions, which is a lot of time. While you're thinking about your questions, Samantha's given me a couple to kind of start off with here. So, let me just begin with... each of you laid out potential pathways to consider how to get to 100% clean energy. And some of you touched upon this, but I just want to put it back to all of you, to identify what you think are the key policy levers that we should be prioritizing to get us there. Who wants to start off?

Mike O'Boyle: 00:48:49 Sure. Well I think Kim really highlighted the role that markets play, in sustaining investment in new natural gas, which is kind of unacceptable, given the emissions trajectory that we need to get on. So, I will defer to you, to expand upon that perspective.

Mike O'Boyle: 00:49:13 I think regulated utilities also have a lot of control over their specific integrated resource planning, and decisions about what generation to either procure from the market or build to the extent they're vertically integrated. Integrated resource planning really needs an overhaul, as well. I think some of the same baked in assumptions in market design, that Kim highlighted, are also present in integrated resource planning, and reserve the definitions, embedded in reserve margins of sort of, what does resource adequacy look like. But, in particular, integrated resource plans really rely on the inputs that utilities provide into their modeling. So, there's the

issue of inputs, and then there's the issue of the modeling itself. Which may sort of lack sophisticated modeling, of how renewables can be used to provide reliability services, modeling how storage can be used.

Mike O'Boyle: 00:50:15 Because, many of the models just don't really do a good job and energy storage. And then the demand side resources really don't get integrated into the integrated resource plan, hardly at all. Lots of them project load growth that never materialize, and continue to do so. So, I think reforming those integrated resource plans to actually go out to the market, test the market for real renewable energy prices, and combinations of renewable energy and storage. If they can just neutrally define the services, and allow competition, you see really improved outcomes. I would point you all to an all source RFP, a solicitation that Xcel Energy made, in 2018, for renewables in storage and natural gas. And they got PPA prices, which they published, which is not normal. Usually these are redacted, and secret, and you have to sign an NDA just to look at them, which is not good.

Mike O'Boyle: 00:51:20 And, they had bids coming in—wind at a median price of $18 a megawatt hour, solar at a median price of the low $20s, and then you add storage, and it wasn't all that much higher. And basically, Xcel was then able to procure very, very small amount of natural gas for peaking. But the vast majority of the new energy, was renewables plus storage. And they were able to accelerate the retirement of their cool plants. And really, Xcel is the leader, I would say, in the utility space that others can follow, of what it really means to meaningfully reduce emissions.

Mike O'Boyle: 00:51:57 So, I would just point to integrated resource planning, and then also, those investor owned utilities that own coal, and own natural gas. They really have a vested interest in keeping

those assets around. And so, I think providing new financing mechanisms to allow utilities to not see as much downside, or risk, associated with accelerated depreciation in retirement of those assets, is also really crucial to removing those barriers toward keeping those assets online. Even when they're uneconomic, and don't fit with the emissions trajectory that we need to be on.

Kim Smaczniak: 00:52:36 Yeah, and I will just endorse the value of the all source solicitation of resources, and really identify what does your system need. I mean, that's a basic principle that underlies both, in the vertically integrated and the market side. You said that we are more neutrally defining the services that are needed, as opposed to trying to identify particular attributes or fixating on what we think the characteristics are needed that will serve the system, the better we're going to be able to allow actual technologies to compete andAnd, lo and behold, renewables plus storage is a fantastic set of resources that can do a lot, and there'll be innovation to provide additional services where there are gaps, and how you get that innovation, unless you very clearly define those needs. I will say from the regional market side, we are very far from having that kind of ability to see that manifest.

Kim Smaczniak: 00:53:28 The assumptions that are baked in, and the kind of institutional structure that has developed around that, the heavy voice of utilities in the regional market, in terms of influencing the direction of the development of those markets, baked into how decisions are made, the software, the technicians, the hundreds of folks who are involved in grid operations, they are used to a certain way of thinking, and it is a difficult thing to change, change that quickly. But, it is a priority. And I think "magic wand" and we switched away

from a capacity market model to something different.

Kim Smaczniak: 00:54:02 Maybe it's a little more ERCOT like, but that's not likely to happen very quickly. I still think you can start to unravel some of the excesses of the capacity market, to try to move it in the direction. We've seen a big step forward in PJM, and it focused on more of a service that you need, which is reserves, and emphasizing procuring that through energy markets, which is a little bit more—there's a little bit more competition there. I have some beefs about how PJM has implemented it, but the idea of it is something that would then move revenue away from the capacity market, into the more granular energy markets.

Kim Smaczniak: 00:54:40 And it looks a little bit more like that competition, like he's talking about, where you're saying we know we're going to need some kind of reserves to be available. Let's let everyone who's capable, try to compete to provide those, and not add a lot of administrative layers to who count. So that's a great example. But I think ultimately, what I'd really like to see is the model that we saw with the storage order. I'd like to start to see that with distributed energy resources. FERC has put that on hold. The next step is thinking about, we have so many more small, available resources, that can look very different from this. Now we have a big huge amount of capacity in one place, and we need to build transmission around it. And so, what happens, when you start to be able to build in? What is the actual resource adequacy benefits of those resources?

Kim Smaczniak: 00:55:27 What is the ability to be more reliable in the face of events? Since many outages on the system, are the cause of transmission. And, you happen to get the power you need, from where it's produced to where you need it. So, what is the value of that? and, should we be

incentivizing that through our market structures, instead of having state policies, that are the thing that causes that to be built out, rather than the actual compensation of to create the innovation. We need to value that in our markets, and it hasn't happened. And it won't happen till we finish a rule that, similar to the storage rule, looks at what are the capabilities of these different type of resources. Capabilities, and limitations of course, but also, really does value for what they provide to the system.

Kim Smaczniak: 00:56:19 There's a whole slew of different market changes I could imagine, including getting at the barriers between seams of market. We need really to think about the system as a more integrated whole. There's a lot of arbitrariness about the rules on one side versus the other that serve no actual system benefit but create a practical barrier to being able to flow power from one side to the other. Even though, physically, geographically, these places are not that far apart. The rule differences make a big difference, and things like that are absurd, and we can do better. And that's what you need to get to a 100% clean energy—more integration, and more ability to see across the system. Where are the assets that we have, and how can we balance things?

Josh Robichaud: 00:57:08 To round up the hat trick, I agree. The resource neutral procurements, I think. is an interesting way forward. But no further insight to add other than that.

Mike O'Boyle: 00:57:17 Yeah. I think carbon price would definitely help too, just to throw that out there. A man can dream.

Kevin Jones: 00:57:31 Like what you said, with the long life of new natural gas plants. And Josh, I think you touched on this. If we move rapidly for de-carbonization, there's a need for existing... We may not need new resources.

Kevin Jones: 00:57:49 Is there a consensus on the panel? Or what are the... That you will think about how we should be thinking about new natural gas plants. We have to be very careful about approving new natural gas plants in the market.

Mike O'Boyle: 00:58:05 I think that's fair, careful. I mean, if you really look, to Kim's original point, about the need for speed and scale. We should be extremely skeptical, just from a climate mitigation standpoint, of any new fossil fuel infrastructure. And the lock in that is likely associated with that. So that would just be my first point. I don't know if there's consensus. I mean I've seen modeling from vibrant clean energy, for example, of an 80% reduction in power sector emissions, relying mostly on wind and solar generation, that shows natural gas capacity sort of remaining flat, to slightly declining. But the share of energy goes from 40%, as it is now, down to 20%, we have to figure out what market mechanisms can keep the natural gas that you know you need, for the reliability services it provides, but also allow for competition from other resources to provide that same service, and then to drive that last bit out of the system. You need policy to continue to push on that. I don't know that just raw economics is going to do it. But yeah.

Kim Smaczniak: 00:59:44 So, we have a very simple answer. Yes, no new gas build-out, period. That's where we're at. The science behind climate change drives that. Of course, are investors still able to make money on new gas? Yes. And are there proposals, and will there be regulators who approve it? Yes. In fact, we will continue to see that happen. The answer for society, for the public at large, is no, we should not be building them.

Josh Robichaud: 01:00:10 I think if you're going to be building, we need to be thinking about some creatively. The way that the Long Beach example was. To think

about it only as it is now, of just a static generator, that whether it be base load, whether it be peaking, to have it narrowly viewed that way is going to create a different reality. But to be open to energy storage, or other methods of getting more utility out of that main asset, I think there's a path forward.

Kevin Jones: 01:00:41 I have some more questions here, but I'm going to open it up to the audience, because I know we have some very knowledgeable people out there. And I know from having some of them in the class, there's certain people here that definitely always come full of questions too. So, who wants to kick it off? And Brian's smiling in the audience, because he's had this class. Who wants to start off?

Audience: 01:01:09 My question is about upstream natural gas [inaudible 01:01:20] as being very damaging, and what policy mechanisms there are, to really get at those. The states saying, well we're renewable, they only count it in the stack, electric supply chain.

Mike O'Boyle: 01:01:49 I mean, there was a federal methane leakage standard that the Obama administration passed but was gutted by the Trump administration.

Kim Smaczniak: 01:02:04 I believe it's still in litigation. I'm not sure we were involved in the litigation.

Mike O'Boyle: 01:02:07 Yeah. I think the Senate actually decided not to get rid of that. I think that was McCain's dying breath, actually, was to try to keep that regulation in place. I mean, some states are doing better than others. The fracking heavy states vary. I think, I've heard Colorado's methane regulations are kind of a model that other states should build on, to tighten up oil and gas extraction, and methane leaks from that. But I think it's really important to have transparent accounting. The leakage rates that the EPA has published, has been sort of scrutinized, and contested as about half, or slightly more than half, of actually what was

being emitted. So, we need consensus around that, and to tighten that up. But I mean, again to Kim's point, that's just another reason why we need to move off of natural gas. Not just in the power sector, but to begin to stop burning it in buildings as well, as quickly as possible. And those two efforts can be mutually virtuous I think.

Kim Smaczniak: 01:03:22 Right. Yeah. And I would just add, I mean on top of the state, the opportunity for states to ratchet up in the absence of federal action, controls over those leaks. Certainly, that's an authority, that many are looking at, and is going to be important mechanism to control that. The other piece, which Mike had hinted at, is trying to limit the growth of the infrastructure, and the use of this in other places. So, we are thinking about where is this gas going in other places, other aspects of the value stream. Petrochemicals. When gas isn't being sold in power, folks are using it to make other products, and we're very much engaged. Most of those petrochemical factories, plants, are in places that are facing horrific environmental injustice. Cancer alley, they're burden after burden. They already have multiple polluting sources dumping toxins, and then on top of it, these petrochemical facilities, which emit absurd amounts of carcinogens, are being built in their backyard.

Kim Smaczniak: 01:04:26 And so, this is where the gas products being used if it's not being burned for power. Then there's gas in homes. And you've seen a number of places in California start to ban new gas hookups. Let's move to other sources for heating. This is an industry that needs to go away. You know it needs to go away. Let's start to look at all the places where it should no longer exist, because we cannot have an inhabitable planet as long as this industry continues to thrive. So we need to look for an alternative, and we need to have a phase out

across the board. So I think the leakers are important, but there's a whole other rest of the value stream that we're certainly thinking about. Lots of communities are thinking about, because they haven't had a choice. The consequence of that industry is being dumped on their doorsteps, and so we continue to fight those fights.

Kevin Jones: 01:05:17 Doctor.

Audience: 01:05:26 Thank you, Kevin. My first question is to Mike. And then the second one is to everybody. Now, I was wondering in your model, I believe the ideal clean energy means that you had in the 2050 scenario was a system powered by 100% renewable energy, like green solar. So I was wondering, to what extent, or did you guys look at for example, the opportunity costs? And we all know the challenges with those sorts of energy productivity compared to natural gas, for example, or the typical base load systems like nuclear, like Josh was saying. Did you kind of factor in the usual opportunity costs on changing our electrical system to entirely renewable energy of [inaudible 01:06:25]?

Audience: 01:06:24 And if that was a useful question, then will that affect the equation of whether a potentially just pull source, like natural gas, will be useful at that point in time. And the second thing is: did you also look at, for example, the sources of the major company that build these massive batteries to solve the storage issues related to clean energy? The sources of the material that goes into production of such batteries essentially come from very few countries around the world. And we still have a very big challenge, with storage. I think there's no storage capacity, to kind of push renewable energy to that amount to preserve baseload while still managing that the market, and the Sinai system needs. So will that affect the security of supply

dimension to this challenge, to this issue? When you consider future role of natural gas, because for example, when you have an abundant supply of natural gas, [inaudible 00:33:53] there's demand and investors are willing to invest contributions to impressing them. So then the last question will then be, it's so complex to move away like you were just saying, so to move away from this reliance on natural gas or the question of capacity markets, then shouldn't the effort of policy and regulation be focused on ensuring that the operators of natural gas utilities and the operators of the natural gas supply production facilities be responsive to what they need to do in terms of environmental costs that they have

Mike O'Boyle: 01:08:48 The model... It's not a capacity expansion or sophisticated electricity dispatch model. And so, the de-carbonization of the power sector, I would not say stands for an authoritative pathway to ensure... That sort of proves the case that the power system will operate reliably at 100% clean with this resource map.

Mike O'Boyle: 01:09:18 So it should not be viewed that way. It's an approximation because it's across the entire economy, and that's the role the model plays. It's demonstrative. It does have reliability requirements built into the model. But I would say, compared to say the NREL Riese model or, or WIS:dom or, or any of the other power sector, Patsy extension models, it's not nearly as sophisticated. And so, I wouldn't look at it as proving that point.

Mike O'Boyle: 01:09:54 It does look at opportunity costs in the sense that different policies have a cost curve—sorry—different policies are compared in terms of their, their abatement costs of the policy.

Mike O'Boyle: 01:10:06 So the cost per ton abatement. Many policies are negative, others are positive. So many efficiency policies actually have a negative

cost, meaning there's a benefit associated with producing emissions. Some of the industrial policies are quite, quite costly.

Mike O'Boyle: 01:10:22 So that is, that is what it is in terms of... But what it does do is allow you to, to see cross sectorial interactions in a way that's sort of user-friendly, and I think generally helpful. The other thing is that the net-zero scenario, I wouldn't call it the optimal path to get there either. It's really like, can we use policy to get there? Is a fundamental question, and it answered yes, but it's going to take extraordinary action.

Mike O'Boyle: 01:10:55 There are other scenarios embedded in that and you can sort of build your own where you're not testing the limit of the model so much where you know the share of renewables and other things are sort of more in line with experience and things that we've experienced before. Getting to that zero by 2050, I can't overemphasize how dramatic a shift in the economy that that will take and so modeling that 30 years in the future or longer, I think there's so much uncertainty built into that. I'm just going to

Mike O'Boyle: 01:11:24 In terms of sources of storage materials, I wouldn't call myself an expert in that area. There's a great episode of, I don't know if you guys listen to the Energy Transition Show podcast by a guy named Chris Nelder who works at Rocky mountain Institute. He interviewed one of the leading national experts on

Mike O'Boyle: 01:11:45 There's rare earth metals that are needed and are really concentrated in other countries. He seems to think there's not much of a supply constraint from like availability in the earth perspective, but it really does show you the importance of international collaboration in, in making some of these technological transformations happen economically. And, you can look at the sort of current

administration's antagonism toward China, for example, as a potential barrier to cost-effective storage supply chain procurement. So I can't remember the second question, but I'm going to defer to my panelists so I don't suck up all the oxygen.

Kim Smaczniak: 01:12:23 Just to add an aspect of the materials that are crucial in order to build battery storage. And, we've been thinking about that from the impacts on communities as many of these materials are mined in places that lacked good regulatory structures or governance protections.

Kim Smaczniak: 01:12:44 And so, there's a real, there's a real issue with the kind of expansion of storage that you're imagining happening globally, if there are not efforts to address protections for communities who are impacted by that massive amount of extraction. So we are looking and thinking about what is our responsibility as clean energy advocates to be thinking about what the right global responses, what is the right response from an NGO from within the US to that kind of problem. And it does pose very difficult problems where this extraction happens in a context without good rule of law or environmental protection.

Josh Robichaud: 01:13:24 It's a little tangential, but on the battery and resource point, I recently came across the recycling of batteries. We have a pretty robust and well understood system for recycling lead acid batteries. So, like a car battery or something like that. Partially driven by policy that that prevents you from throwing it out. It's built around being recycled. But we have a very robust and good way to do that.

Josh Robichaud: 01:13:51 When it comes to the newer technologies being lithium ion, nickel, I believe, because the very variations in chemistry, size, utility, we just don't have the same amount of have ready-to-go recycling infrastructure to be able to do that. I think it's a large opportunity that

somebody could definitely jump into. But, to think about recycling those in the same way is a little different but a large opportunity, nonetheless.

Mike O'Boyle: 01:14:15 Yeah. I think DOE is starting a program to like research scaling lithium ion battery recycling, just for what it's worth. They see it as a priority.

Kevin Jones: 01:14:26 Just one thought. One of the interesting things is where the batteries are going to come from. First really are the auto industry and you know, because the volume of batteries produced for that. So one of the exciting things actually for creating opportunity that is sometimes often anticipated is using on the electric grid the car batteries and their second life. Because once you're down to like 80% capacity, you might not want to drive them around in your car. They might not be so efficient, but they're great for grid storage.

Kevin Jones: 01:14:53 So, it's thought to be in one of the things that... a long along life there for that first-generation battery before we have to think about this important point cycling.

Mike O'Boyle: 01:15:01 Yeah and that's, I think part of what's driven the cost of storage down so much is the electric vehicle market scaling with the utility scale storage market and that is helping the industry move down the cost curve way faster than people thought. It's really exciting time. There are questions of your term.

Audience: 01:15:20 I think we have time for one more.

Audience: 01:15:20 Okay, lucky me. Hopefully lucky you.

Audience: 01:15:25 [laughter]

Audience: 01:15:25 I just want to say thanks for the interesting panel. Appreciate it. Kevin, thanks for preparing this to understand what's going on. So I know we're doing kind of policy wish list. I liked the carbon price in the wholesale market and, forgetting which classes it was we took at Vermont Law, the article we read by, I believe it was Dave Roberts, saying that $15

per megawatt carbon price would roughly keep current nuclear plants on through the end of their licenses, and a roughly $25 price would either extend them beyond or the intent is to buy new plants. I can't get more detailed than that, but I think that's an interesting way to deal with a natural gas issue. It's broke. We are planning for that massive capacity we do need.

Audience: 01:16:12 On the other hand, I'm thinking more along the lines of shooting resources, demand response as a way to shrink that requirement that we need quite enough energy efficiency. You know a lot of people think that we've ate all the low hanging fruit, but I believe that that's not true. There's a good article by Amory Lovins—I think we're probably all familiar—about the true size of the energy efficiency resource. Recommended highly. B[illegible]ut, I'm just, my question I guess is: what do you folks see as limitations on either energy efficiency or ERs in general, and then what is kind of the potential weight as a way to eliminate the need for that heavy peak kind of bringing down that peak quite a bit so we don't use natural gas?

Kim Smaczniak: 01:17:05 I mean, I would say it's, I agree there's a huge amount of reason to be excited about the latent potential for energy efficiency, demand response, and also distributed energy resources like rooftop solar. We, we don't even really have a good solid image of how much we could do with that resource if it was fully tapped.

Kim Smaczniak: 01:17:29 So just an anecdote, folks. you know ERCOT is in Texas is a market that doesn't have a capacity market, doesn't have a tight reserve. It's really on the margin, particularly in the summer when you know those peaks really happen. And, the anecdotes I've heard from people who are working and investing in that market is that they are actually, the peaks are

so high and so expensive that they have latent, what, what would be called demand response, but it isn't being paid by the market.

Kim Smaczniak: 01:17:58 People who are basically saying it makes more sense for us not to run now and run somewhere else and to change how we're running in order to respond to market signals and that they have some financial arrangement that not through the market that makes it work for them to make those adjustments. Right?

Kim Smaczniak: 01:18:17 And so, that's happening just because of prices out there, and nobody's actually even paying you money. Imagine if someone were going to pay you money, right, to make those minor adjustments. There is so much potential with the ability to have responsive technologies in our homes, thinking about what that capability means to connect the time when you're consuming the energy versus when it should be in order to respond to needs. We have no idea of what all of the synergies could look like once all of those are brought to bear with a common direction of making sure that we don't ever get too close to the point of not having enough stuff to meet what we need.

Kim Smaczniak: 01:18:51 And so, I just feel like there's... it's been discussed a lot, this idea that we could be doing more. We haven't yet even taken the rudimentary steps to start to see how they interact and then to look at what's the truly innovative stuff that could come down the line after we have a real price signal for it.

Kim Smaczniak: 01:19:05 So that's my view on it. I think it's exciting. I think it takes a lot of people who are not afraid to try to think outside the box, which you don't always get in engineering land and grid operator world, but once we have the incentives aligned for that to happen, I think it's going to be fantastic.

Mike O'Boyle: 01:19:21 I totally agree with you. Not surprisingly, there's a lot of agreements between us, but I would just point you to the other part of that which is that rate design is under the jurisdiction of public utility commissions for the most part and the investor-owned utilities that they regulate. And, those utilities, frankly, have a disincentive to maximizing demand side resources because they function as a resources that avoid the need for utility investment.

Mike O'Boyle: 01:20:03 And, under the current cost of service model, utilities make more when they can justify investing more in physical infrastructure. And by making the system more efficient and not building more poles and wires but also power plants where there's vertical integration, these utilities really have an incentive to obfuscate and especially not to proactively adopt demand side management as a core business model, which I think is what we really need to meet some of the potential that that Kim has said.

Mike O'Boyle: 01:20:31 Rate-design changes generally get proposed by utilities. An outside stakeholder has limited power, resources, ability to make those things happen. You need the utility to be motivated properly. And so, that's where I feel like this movement towards performance-based regulation is really important.

Mike O'Boyle: 01:20:49 That's happening in different states, including Hawaii, New York, Minnesota—Massachusetts stuff gets mixed reviews from me—Rhode Island. But anyway, I think there's a lot of potential to find ways to compensate utilities for providing those demand side management benefits and get away from capital spending as a key shareholder value maximization proposition and instead get them more aligned towards efficiency, or else try to restructure the way that utilities can operate. I think some of these

third-party administrator models for efficiency, including in Vermont, have been quite successful as well. So we really need to think outside the box and also unlock, you know, provide new interesting price signals to customers. I think it's right on.

Kevin Jones: 01:21:42 Yeah. I want to just ad lib one quick announcement here while I'm here. When Mike mentioned podcasts- I want to make sure everyone is aware of the Vermont Law School Environmental Law Center's new podcast the Hot House Earth. And I keep thinking, because I look up and see the cohost, Jeannie Oliver, is an assistant professor with that energy clinic. I'd also like to offer big thanks to Smith &

Kevin Jones: 01:22:08 Samantha, we are so sorry you weren't able to be here with us today and thank you so much for your commitment to VLS, and I don't think you could have put together a better panel and more effectively covered all of these complex and interesting issues. So, thank you all.

PANEL TWO: CHALLENGES & OPPORTUNITIES FOR GRID SCALE SOLAR DEVELOPMENT

Zoë Gamble Hanes: 01:22:22 And now we're ready for panel number two.

Zoë Gamble Hanes: 01:22:28 Yay. So can y'all hear me? I can't tell what this thing. Is it on? All right, my name is Zoe Gamble Haynes and I am a graduate of [inaudible]. I was there that first year that Michael Dworkin came and taught energy law. I think I took the first energy law class at Vermont Law School.

Zoë Gamble Hanes: 01:22:53 And my background is that I moved to North Carolina following law school. I took whatever job I could get, which was doing affordable housing tax credit work, and I hated it. I cried every single day at my desk. I was just saying to a new lawyer over here that I questioned the intelligence of going to law

school, and my managing lawyer would throw documents in my face. He would forward emails with 10,000 question marks in front of them, and I learned how to do something really boring called tax equity.

Zoë Gamble Hanes: 01:23:35 And when North Carolina became the epicenter for at the beginning of a huge solar boom, I was the only young, stupid enough person to charge $180 an hour—I think was my billable rate then—to represent a bunch of solar startups because I knew tax equity.

Zoë Gamble Hanes: 01:23:56 And that put me in a really unique position. I got to work with virtually every solar developer and landfill gas developer that came to the state early on and then ultimately was recruited to become general counsel for FLS energy, which was a solar company that ultimately sold the Cypress Creek, which at one point in time was the largest solar company. At that time it was.

Zoë Gamble Hanes: 01:24:21 There's often a churn in this industry. We call it the solar coaster for those of you not in the solar industry. We call it the solar coaster. And then I was the CEO of another solar company called Time Dating Renewables. So I had sort of a business hat and a lawyer hat. And I give you all that context because what I want to say is that... then I left about a year ago and came back into private practice. I'm now at Nelson Mullins, which is a larger firm in the Southeast.

Zoë Gamble Hanes: 01:24:53 And I'm giving you that context because the solar industry is something that is really unique in this point in time in our history. It has incredibly low barriers to entry, relative to natural gas. And so you have this influx of an entrepreneurial spirit and people who have been willing to take pretty significant risks for a reward.

Zoë Gamble Hanes: 01:25:20 It's also mission-driven, and so it attracts a lot of young talents to the industry. And ultimately, that scrappiness has prevailed.

And so you have seen this huge growth in solar in ways that nobody imagined possible. Even 10 years ago when I started in this industry. If you had told me then at that time I would end up installing utility scale solar... when I joined this other company, it was around $7 a watt. It's now regularly being installed at sub-80 cents a watt. In 10 years. There's a lot of factors for that. But fundamentally what makes a utility scale solar project work, is it as a financeable revenue stream.

Zoë Gamble Hanes: 01:26:11 And so, that is the framework that we're going to have this discussion about. What is it that makes, what are the legal issues, what are the regulatory issues, what are the policy concerns that are going to get more solar built?

Zoë Gamble Hanes: 01:26:26 And, at the end of the day, what makes solar get built is having a financeable revenue stream. And so, when you think about that... I said we have a developer who- I'm going to let everybody introduce themselves.

Zoë Gamble Hanes: 01:26:40 So, and then everyone will take three to five minutes and just some stuff in what you're doing. But the context, we're going to talk about the development as a developer. What are some legal challenges that pop up as it relates to zoning or siding or what does it take to actually land and secure a revenue stream?

Zoë Gamble Hanes: 01:26:57 And then we have break out the other major policy drivers in regulated and deregulated states. Okay? We're going to talk about regulated dates and how that factors into also the ITC, and we will talk about deregulated state. That's the framework for our conversation. You guys want to start, Jonathan, and introduce yourself? Yeah, and where he came from, how you came to be here. What's your astrological sign?

Jonathan Willson: 01:27:27 I'm Jonathan Wilson. I did the energy clinic. I was a master's in energy regulation and law

student a number of years ago at Vermont Law School. After leaving the clinic and joining the working world, I worked for a very short time in energy efficiency consulting before being recruited into a small entrepreneurial, scrappy develop-and-flip solar shop, that was the first solar company in New England to do true utility scale wholesale-market-participating solar assets.

Jonathan Willson: 01:28:01 That was Ranger Solar. Ranger Solar was acquired within 18 months of me joining the firm by NextEra Energy Resources after we kind of demolished a tri-state clean energy RFP to deliver power to the large utilities in Massachusetts, Connecticut and Rhode Island. We took about 80% of the awards. No wind was selected, which was a very... it was a strong market signal.

Jonathan Willson: 01:28:32 We were acquired by NextEra Energy Resources within pretty much weeks of that announcement where I then joined their utility scale solar development office, doing projects in PJM and ISO New England at all stages of development, from greenfield through advanced state level permitting.

Jonathan Willson: 01:28:53 I now work at Capital Power, which is a Canadian IPP that owns mostly thermal assets but also wind and is growing into the utility scale solar market. I do mergers and acquisitions activities there for them. Managing all renewable acquisitions in the United States and then doing wind development as well.

Jonathan Willson: 01:29:15 That's me.

Katherine Gensler: 01:29:18 Hello, I'm Catherine Gensler. I'm the vice president of regulatory affairs at the nation's only solar-trade association that represents companies all across the US of the solar energy industries association. I unfortunately have no connection to Vermont Law Schools. I am honored to be here anyway. Yeah, Zoe asked me to, so I showed up. But, your

description of the solar industry is really accurate and tracks mine pretty hardily.

Katherine Gensler: 01:29:50 I have a policy degree, my master's degree from the School of Public and Environmental Affairs at Indiana University. A program that probably many of you looked at when you were considering where to do your grad school. And after graduating I came to DC and I took a job at the Federal Energy Regulatory Commission specifically so I could work on federal energy policy. Lo and behold, those are the people who do the most of it.

Katherine Gensler: 01:30:14 Do not be fooled. The Department of Energy makes almost no federal energy policies, that is not their role. But then, I got a wild hair and I left my safe, secure government job in order to join a scrappy, little, I call it nearly still-in-the-garage stage of this trade association, which had been around since 1974.

Katherine Gensler: 01:30:38 But when I joined, there were eight employees and I think half of the people on our membership list didn't actually check their emails. So, since then we have certainly emerged into what is the powerhouse that we are today. We've got 50 employees, we cover states, we cover federal, and our membership lists is a thousand companies. And most of those people do actually respond to their email and send the membership check when it's due. So that's the most important part.

Katherine Gensler: 01:31:10 Most of my work has been with utility scale developers working through issues created at FERC, the Bureau of Land Management, sort of in the siting and permitting world. I learned a lot about species that I never wanted to and have done tons and tons of work in the last four years on PURPA. Raise your hand if you know what that acronym means. Yep. That is more than usual. If you have read any news coverage in the last six months about PURPA, you have probably seen a quote from me in

there. I am on the phone all the time, which is great.

Katherine Gensler: 01:31:46 But, I look forward to the rest of our conversation and turn it over to Steve.

Zoë Gamble Hanes: 01:31:52 Yeah. And just to underline that point about PURPA and as it relates regulated market for those of you that don't know, you may not know is that when we talk about regulated and deregulated markets where markets have opted to deregulate, PURPA is not as applicable. But what PURPA allows is it forces utilities to purchase power from renewable resources that are less than 80 megawatts in size in the states where they have not been deregulated. And so, that was the mechanism which grew North Carolina in a regulated market to become the second largest salt state in the country.

Stephen Shparber: 01:32:30 Thank you for having me here. My name's Steve Barber. I work with Zoe also at, Nelson Mullins. I'm in the DC office, Zoe's in Charlotte. So I just, a little of my background, so I'm an attorney and my path here, it's actually been really rewarding because when I was in law school, I graduated law school 2010, and I really after about my first year wanting to get into the renewable energy field.

Stephen Shparber: 01:32:56 So I went to law school in New York and you know, it was like, you know what, I'm going to go do project finance. And they fortunately did well my first year and was doing all your normal 2L with the interviews with law firms. And if you get a little bit by dating of when I graduated, that means my 2L law firm interviews was the fall of 2008, so I was going to interview with law firms the week Lehman Brothers filed for bankruptcy.

Stephen Shparber: 01:33:20 So all of a sudden all that transactional stuff that I thought I would be doing and doing all these wind deals, etc. Those offers, were no more. However, I had a professor who told me about a little regulatory agency called the

Federal Energy Regulatory Commission and said you should go try out here. They do all these things in the energy space. And I was like, sure, I need a job.

Stephen Shparber: 01:33:40 So true story, went to New York Law School, went to NYU undergrad when they were reading my application, thought I went to NYU law school, which is a better ranked school and that's how I got the original interview. And then I, then I crushed the interview after that after that was new. But that's how I got through the stack back in the fall of 2008 is they misread my application. So I'll take it. Sometimes better to be lucky than good for all you law students out here.

Stephen Shparber: 01:34:08 But anyway, I went there during my 2L year and then wound up actually going out there afterwards. Started my career at FERC and really was a FERC attorney, and still am, a two-year forum out of law school at FERC. Went to a law firm in DC.

Stephen Shparber: 01:34:25 I think the reason I'm here that I have been spent four years in house at PJM. PJM is the largest wholesale market in the country. I was the Lead Markets Attorney, learned a ton about how the wholesale markets operate. And about two years ago I was looking for an opportunity to move to, I wasn't thinking about going to a law firm, I just got my MBA at night thought I was going to do more of an early kind of work at a growth stage company cause I was there and I said look, there are all these opportunities but in the wholesale market swap, renewables aren't really understanding them and not taking advantage of them.

Stephen Shparber: 01:34:57 And I met our boss, Larry Austin, who's down in the Charlotte office, and he said, yeah, well, we have a bunch of solar clients that are working in this space, in storage companies, etc. Why you come and do this outside counsel?

Stephen Shparber: 01:35:08 And I was like, well I have all these crazy ideas, will you let me do them? They said, sure. I said, okay, well I'll, I'll take the job. And I also had to move from Philadelphia to DC cause my wife got a job around the same time. So that's how I've been in Nelson Mullins. So I've been there for about two years now. And what's really cool is that I've been able to build my practice where I'm now outside counsel to some of the major renewable energy trade groups, American Wind Energy Association and Solar Energy Industry Association. And I helped them allow the FERC and the RTO work, regional transmission organization, the deregulated markets, and have the privilege of doing that.

Stephen Shparber: 01:35:44 So somewhat earlier, it's cool because now basically I get paid to say all the things I was saying in house at PJM when people weren't always listening to me and now I get to write it and do that, which is great.

Zoë Gamble Hanes: 01:35:56 And then also do people listen to you now?

Stephen Shparber: 01:35:59 Now? Hopefully, yes, you do for the most part, which is good.

Zoë Gamble Hanes: 01:36:02 No. I mean the PJM people.

Stephen Shparber: 01:36:04 They're doing better. They're getting, they're getting there. It's a good process. I'll tell you, I think it's the RTO world and the people that will listen to you more than in the regulated markets in the utility world, so we can get into that a little bit. And then also, on top of that, I do it with deal with a decent amount of transactional work as well and because, as we'll talk about, a lot of the central financial cashflow streams and all of that, the regulatory changes, the policy, and the markets is what drives the revenue opportunities to use a business. You know, we're not selling widgets, we're not selling Coca-Cola. The regulatory regime you're in, the market that you're in, will determine whether you have financial cash flows or not.

So it's been cool, it's fun, It's been great to work with Zoe and thank you for having me here.

Zoë Gamble Hanes: 01:36:52 Just to get a quick temperature check. I think most people in the room know NRG but, but if we started talking about RTO, PJM everyone, if everyone, I don't want to over or under [inaudible] about this issue. We can get super into the weeds.

Zoë Gamble Hanes: 01:37:10 Raise your hand if you have never heard of the word RTO. Okay good. So we are trying to level set for it. All right, so John if you could give me where are you guys primarily developing and what are the issues that you're facing, what informs your strategy for where you're going to pursue project development, and what have been the biggest issues you've been facing?

Jonathan Willson: 01:37:44 Sure. Capital Power is a very new to the utility scale solar industry, especially here in the United States. And so we, over the past few months have been kind of developing our key target markets and investments strategy here in the United States, buttressed by a $10 to $20 million Safe-Harbor Investment that we are using to build out a couple hundred megawatts between now and 2023.

Jonathan Willson: 01:38:14 We are a large owner of thermal generation. In the United States, we own two large natural gas combined cycle plants, one serving Arizona public service, APS, outside of Phoenix and the other in Decatur, Alabama serving TVA. And so what we've tried to do is think about our experience in the wind industry over the past five to 10 years. How do we, how do we see the wholesale markets developing? Where do we feel that we are strongest and how do we leverage our existing capabilities and assets to grow our portfolio?

Jonathan Willson: 01:38:48 For us, that's led us specifically to markets that are a little harder to develop in than a lot of other developers are willing to go into

places like TVA, places that are bilateral in nature and they don't have liquid off-take. There's not a lot of companies that you can go to for origination. You really need to be able to leverage your relationships and develop a good product that has a very high likelihood of re contracting.

Jonathan Willson: 01:39:16 Since your merchant curve in an unorganized market and a regulated market is much harder to forecast. And so that's what we have primarily focused on. On the deregulated side, in wholesale markets, we really like MISO, their supply and demand outlook as well as PJM just because of its size. Primarily, when we look at a market, we look at what is our LCOE for our solar project moving into the future, what are the reserve margins look like?

Jonathan Willson: 01:39:50 What is our competitor analysis? We're really targeting the same exact market as wind and so if we think we have a competitive project that can compete toe-to-toe with wind, then we will lean towards solar in certain markets.

Jonathan Willson: 01:40:04 And so that's what led us, in Southern MISO and central MISO, to move more first solar as the PTC expires. PJM is a much tougher nut to crack. It's really a number of wholesale markets and geographic areas and resources all kind of crammed together. And so we have to really hone down into the details in a market like a PJM to say, what is my specific value to my customers in this specific location on the grid and how do I compete against the nine other gigawatts that are currently queued up, just in solar, in PJM, right now? There's a couple of gigawatts queued up in Ohio, so why do I need to be there is always a question that we look for. Liquid off-take or strong re contracting.

Zoë Gamble Hanes: 01:40:47 I heard three issues I'm going to tease out a little bit.

Zoë Gamble Hanes: 01:40:50 The first one is that when you're operating at regulated market or simply that you're going

in and striking a bilateral agreement with a utility like TVA or Georgia. When you're looking at your merchant curves, are you relying on PURPA as you're back stop for the merchant pricing and if so, how is that being received in the market, and has there been any issues with the recent filing? Have you gotten any questions about the viability?

Jonathan Willson: 01:41:26 We run PURPA as a sensitivity, but at this point if we had an initial 15 to 20-year contract signed for solar, we don't know what PURPA's going to look like at that time. What we try to assume in our re-contracting is what are the avoided costs that they're going to be facing, what do we expect natural gas is going to be in this market, and at what price can we re-contract and still meet our investment hurdles?

Zoë Gamble Hanes: 01:41:53 And that's really a recontract. You're not using a baseline.

Jonathan Willson: 01:41:56 We, we run kind of, it's like a blended approach.

Jonathan Willson: 01:42:00 If we had to go really worst cases, PURPA, re-contracting or what is the chance that these guys join a wholesale market? It's typically how we do it.

Zoë Gamble Hanes: 01:42:11 To tease it out further, the same life of a solar asset is somewhere around 40 years, 35 to 40 years. I'm going to use 40 as an outlier per se.

Jonathan Willson: 01:42:21 35 is financeable.

Zoë Gamble Hanes: 01:42:23 We'll say 35 to 40. And the contract terms have been driven down over the past 10 years pretty precipitously. Where you used to be able to get a contract for 30 years that are now 15, 10 sometimes even five. And so, the PPA term is 15 years. You're having to put in a set of assumptions for the balance, because the first capitalized costs are basically taking up the entirety of the contract and term is paying down the cost of capital. Those assumptions on a post merchant tale are...

Jonathan Willson: 01:42:58 Yes, those assumptions, they really swing value. I think they swing it even more in a deregulated market. Somewhere like an ERCOT or a MISO, at this point, over 60% of your net present value associated with your asset is coming in a merchant curve. You're really only taking on the contract if you have investment grade metrics which you need to meet, like we do as an independent power producer, or to please tax equity. You need a certain, at least seven years, preferably more than 10, to fully capture and finance your solar tax equity investment. As those trend shorter, the merchant tale becomes more important and then you get into a lot of crystal ball around carbon pricing assumptions, avoided costs of gas, all of those things. So it's pretty much a crap shoot after your contract period, no matter what market you're in.

Jonathan Willson: 01:43:57 We kind of like the bilateral nature of regulated markets or a place like TVA, since they have shown a propensity to sign longer contracts still. You can still get a 20-year Busbar PPA with TVA. Comes with some strings attached, but it's still possible. And less of your NPV is left in that un-contracted period at this point. Now, PURPA deals have gotten extreme, where the PURPA rates are so low that very little NPV is coming during the contract period, and a lot of it is left out in the re-contracting period. And so, we typically avoid, as an MNA manager, I avoid projects with PURPA contracts that weren't signed really consensually. There was no real bilateral negotiations, or in markets where we don't feel that's a differentiated product in North Carolina or South Carolina. Oregon is another example of markets where a lot of PURPA contracts have been signed that there's lot of re-contracting risks at this point.

Zoë Gamble Hanes: 01:44:55 So the other—and Katherine I'll let you speak too; I will reserve some of this for you—but I

heard if you're talking about live cost of energy width and the effect in your view, how do you project ITC, ITC extension doing calculus of whether it makes sense to safe harbor panels?

Jonathan Willson: 01:45:12 We think a Safe Harbor is kind of pay to play at this point. If you want to participate in the US solar market in 2022, you better have a balance sheet or close relationship with somebody who does have a balance sheet. There's a clear delineation. As soon as the ITC starts dropping off with investments next year, that initial 4% drop in the ITC, we anticipate a $5 to $7 per megawatt hour hit on PPA pricing or on sponsor equity returns. Sponsor equity returns right now are minimal. At this point, it's better to buy back shares than to do a solar deal, unless you believe you're actually getting scale. So we anticipate if you're not investing in Safe Harbor materials this year, you're not competitive in three years. Unless there's an extension, I guess.

Katherine Gensler: 01:46:11 Yeah. Can I?

Zoë Gamble Hanes: 01:46:13 Yeah. Come on.

Katherine Gensler: 01:46:14 All right, so here's what an extension looks like.. Oops wrong slide. I'm sure we had some pretty charts for you all.

Zoë Gamble Hanes: 01:46:22 And just like my pause for a plug for CS?

Katherine Gensler: 01:46:26 Absolutely.

Zoë Gamble Hanes: 01:46:27 So allow me to speak on probably the single most important industry association as it relates to lobbying efforts and has worked tirelessly on really important issues around the tariff and IBC extension and has managed to balance a lot of competing interests between residential and utility scale solar in a way that really works for the industry. In addition to that, it has been active for this event at a statewide level becoming more and more active.

Zoë Gamble Hanes: 01:47:00 We just recently had an industry-wide policy meeting where the issues were highlighted that would be the most important. I though that you might touch on that because that was presented at the Industry Trade Conference that happens every year.

Katherine Gensler: 01:47:19 Yep.

Zoë Gamble Hanes: 01:47:20 All right. Go ahead.

Katherine Gensler: 01:47:21 Okay, so we'll start with the IDC and then take it back to the big picture view. SEIA working right now to secure an extension of the investment tax credit. As the conversation has shifted this year, it is no longer the solar investment tax credits. We got our friends from the Wind Association onboard as well. So now I believe it's being referred to as a renewable energy tax credit, which would shift that structure. The PTC and put wind as an eligible technology in section 48 for the ITC.

Katherine Gensler: 01:47:56 That's the goal. But on the solar side, this has been, by far, the most successful federal policy in terms of spurring investment in the solar industry, deploying solar megawatts, putting solar workers on the job. And we're all happy to talk about it these days, reducing greenhouse gas emissions. And so, our push, in advance of any of these step downs, is to try to secure an extension this year. Obviously, we've got two more years to go. We will make the most use of them if we have to.

Katherine Gensler: 01:48:33 But this chart up here shows what all our modeling and would Mackenzie have modeled as far as what the economic benefits are and the climate impact of extending the ITC. I believe this model is for a five-year extension, so it moves everything. It moves the ramp downs out five years. It moves the 30% along for the next five years. So we're talking about 82 gigawatts of additional solar

deployment above what we would expect to see as the baseline scenario.

Katherine Gensler: 01:49:06 113,000 jobs. We've got about 250,000 folks in the solar industry right now. We expect that to grow, of course, with that baseline growth scenario. But the ITC in and of itself can bring us another a hundred thousand jobs, $87 billion of additional investment. That's pocket change for Wells Fargo maybe, but important to us. And then 363 million tons of CO2 emissions offset. So yes, go ahead.

Audience: 01:49:41 What are the chances?

Katherine Gensler: 01:49:43 Our chances are great. Who has a crystal ball? That's the real problem here. Right? We have bipartisan support. We have eight Republican co-sponsors in the house. We have not sweet talked somebody in the Senate to putting their name on the bill yet, but we've had lots of good behind the scenes conversations. So we're still waiting for tipping over into that public sphere.

Katherine Gensler: 01:50:07 There is an understanding of the urgency both from the climate imperative as well as from the investment imperative. People need to be able to make business plans. Jonathan has already had to talk his bosses into spending money this year in case we don't get an extension. So, knowing that regulatory certainty drives investment decisions and drives employment actually really resonates with policymakers who like to keep their constituents employed. So, it is always, we are subject to the whims of the big picture stuff that is going on in Washington. But we have always had bipartisan support and even going back to when the investment tax credit was first put in place at that 30% level, that was Epact 05. But those of you who are still in school then, let me remind you, we had a Republican president and a Republican controlled Senate. That was a bipartisan piece of legislation at the beginning. When we got

the passage of the eight-year extension in 2008, that too was signed by a Republican president.

Katherine Gensler: 01:51:20 We had strong bipartisan support, particularly in the Senate with our friends from California and Nevada and Washington. They really worked to make sure that went through. I feel very badly for Lehman Brothers and all of their investors and employees. But you know what? We wrote along with that bill. It was the most chaotic legislating time I've seen in D.C. was that fall of 2008 era. And that was when, after three years of action, we finally got a long-term extension of the investment tax credit passed.

Katherine Gensler: 01:51:55 So, we have continued since then to build up credibility, political capital at a whole lot more friends on the Hill. Partly our lobbying efforts have increased, our member companies, those people who now answer the phones, they come to DC. They do lobby days. Zoe, you've been up here. I know your colleagues have too. We make sure that the legislators are hearing from people in their district and in DC about the jobs and the economic value that solar brings to their region. Yeah.

Audience: 01:52:31 So this is the extension served generally... [inaudible 01:53:33].

Katherine Gensler: 01:52:31 Mm-hmm (affirmative).

Audience: 01:52:31 What is the-

Katherine Gensler: 01:52:37 So that's, again, kind of the push to the end of the ITC. That's like the five-year curve that gets shifted.

Audience: 01:52:44 Got it.

Katherine Gensler: 01:52:45 Yes. So we will always sort of see investment decisions coming forward into that window.

Katherine Gensler: 01:52:55 Yep.

Katherine Gensler: 01:52:55 Before the policy is threatened with disappearing again.

Katherine Gensler: 01:53:01 Does anyone else want... [inaudible 01:53:05]

Zoë Gamble Hanes: 01:53:08 Thank you for that reminder. And I intentionally want it to be a free discussion. This is great. I don't doubt the heads band not necessarily reserving questions. I want to tie something that you're saying that I'm remembering the last go around. Because there was this extension in 2016. Right?

Katherine Gensler: 01:53:27 2015.

Zoë Gamble Hanes: 01:53:29 December of 2015.

Katherine Gensler: 01:53:30 Exactly.

Zoë Gamble Hanes: 01:53:30 And I the conversation about balance sheets, Jonathan, was a very familiar conversation from that time. And it also ties into your comment about interconnection because there had been a dip in development assets as a result of the brake that people put on developing projects when we thought the ITP was going to expire. And because the interconnection timeline has so lengthened, it created the situation in the marketplace where there was more money than there is project. And so, I think one of the important... I'd highlight back is that I think it really ties into what you were saying about PJM and interconnection queue. And if you don't have balance sheet in 2022, like I'm really highlighting and underlining, it's not just about decision making in the near term. It really has a ripple-out effect. Yeah.

Jonathan Willson: 01:54:30 Yeah. And the comments on that further, I think the wind industry is a very good example of the boom bust. I don't know if the solar coaster makes sense. If you want to see an extreme version of that chart, you should look at the expected wind build in 2020. And then it completely hit the floor after that. So we expect some build in 2021, and then it falls pretty much off a cliff after that in most markets.

Jonathan Willson: 01:54:55 Something that you can see around that and going back to the balance sheet is there's about 20 functional wind companies in the

United States, at this point, with any level of development capabilities. The industry is pretty much coalesced around those top 20 owner operators and the 10 or so that have strong development factions behind them. Solar right now has more like 50 scaled competent teams and about five that are independent without a parent company at this point.

Jonathan Willson: 01:55:27 Including Fine Gate, actually. But there's dramatic consolidation coming within the solar industry to make it look a lot more like the wind industry, especially with that slow ramp down in the absolute flood of money at this point. And so, a lot of the develop and flip shops that have been out there capitalizing on declining costs and ITC extensions are slowly diminishing, I would say, or getting purchased, is really the thing. It's not like they're going out of business. They're getting eaten up by other larger companies. And son that consolidation is going to be a trend for us to watch, I would say over the next few years.

Katherine Gensler: 01:56:06 Yeah, and to underscore Jonathan's point, in the 25 to 30-year history of the wind PTC, there have been times that the production tax credit expired. And you can absolutely track on a graph, just the catastrophic decline for a year or 18 months while Congress gets its stuff figured out. And then, they'll put the policy back in place retroactively, but you can't retroactively invest in something. So that has actually been unfortunately convenient for us in order to explain to policy makers why we always need... We can't be looking at the deadline as December 31st, 2021. We're having these conversations now because we need to make investment decisions now for the future and avoid those catastrophic declines that we have seen from other industries.

Zoë Gamble Hanes: 01:57:03 I'm just going to let you continue.

Katherine Gensler: 01:57:05 Sure. Yeah. Let's back up a little bit to the big picture. Part of the role of the trade association is fundamentally to support the growth of the industry, to advocate on their behalf. Steve knows very well. Sometimes we put our name on a filing, take the barbs and arrows because individual companies don't want to have to do that. Right? There's some reputational risk, particularly if you're going to call out her friends, I don't know, PacifiCorp or something, for being bad actors. We do that because we're not trying to sign a contract with them. Some of our member companies are. So the other important things that we do is really provide leadership. Thought leadership. Where is the industry headed? And then our job, once we've set that vision, is on the implementation front to really get to work smoothing the path.

Katherine Gensler: 01:57:59 How do we make it easier for everybody to get their job done? And, that just means we can drive the investment cycle to a shorter and shorter window.

Katherine Gensler: 01:58:11 So, one of the things that SEIA did this year is we got all of our smart people in a room, member companies, nonmembers, a lot of the CEOs, people who are making big picture plans. And we talked about what needs to happen for the next decade. We've decided it's the solar-plus decade. Filler is absolutely going to continue its tremendous growth and be a major part of our energy picture in the United States. So, we have attempted to identify these four areas that we are going to be working in. We put out this giant report. You can read it. It's available on our website.

Katherine Gensler: 01:58:53 But, the roadmap for the solar-plus decade really focuses on: a breadth of collaboration, market accelerators, market levers and policy drivers, and then managing growth of the industry so that we don't get too far out ahead of our skis. And key to this whole roadmap is

that we want solar to provide 20% of electricity by 2030. Right now, we're at 2.6%. So, we're talking about eight and a half, nine X. What this means is the growth chart you see here. Now, when I started in the solar industry with the beginning of 2008, which doesn't even make it onto this chart anymore. Then, our annual installations that year were 354 megawatts.

Katherine Gensler: 01:59:45 We counted every rooftop system we could find, four and five kilowatts at a time. As you can see, by the end of the decade we're going to need to do pushing 80 gigawatts in a year. We already today install more than 354 megawatts on a daily basis. That compares to our 2008 annual total.

Katherine Gensler: 02:00:16 What I think about every day, in smoothing the path, is what are all of the pieces that go into getting a utility-scale solar power plant online and operational? It starts with siting and permitting and the interconnection queue, and then the contracting challenges and how do you attract financing. And then, when you actually build your project, you have to play by all of the market rules, whether that's in your bilateral contract or it within your RTO market. And then we've got operational challenges or just things to keep your eye on like cyber security, which you'll hear more about on the next panel, and the physical assets. I know you guys talked about PV recycling earlier today. Like those long-term issues that also happen at the very beginning when you're getting your approval to cite something. So, these are all of the pieces that we are thinking about. How do we make each step of the process faster and easier for our members? What policies need to change in order to deliver 78 gigawatts in 2030? Who wants to join me?

Zoë Gamble Hanes: 02:01:32 No, I mean I think that, and again, I think you did a good job of laying out each of the

different pieces of the policy concerns and regulatory and legal framework. Just as a side note, and Steve, I'd like you to give us your conversation.

Zoë Gamble Hanes: 02:01:48 I remember there was a time when a lawyer could dabble in each of those areas. Right? A lawyer could do-

Katherine Gensler: 02:01:53 Well you had to 'cause there was only one of you.

Zoë Gamble Hanes: 02:01:55 Yeah. There would be development related issues. Then there was also quickly reviewing your power purchase agreements. And there was doing all of your acquisition. If you were buying a project. Now, lawyers really are specialized in each of these different domains. And I think it's another example within the industry of how, as the industry grows, even within the service providers, there's going to be deeper and deeper specialization within a particular serving particular industry, which you have capitalized on tremendously. I mean I remember as a solar company being asked by you to join this coalition of solar just three years ago. The idea of really participating within market as a solar company was like a someday, maybe conversation. That you could not raise capital around that couldn't go to a bank and get a loan for merchant solar.

Zoë Gamble Hanes: 02:02:54 And since then one being driven by corporate buyers, but also the issues with PURPA that I want to come back to that have made it almost impossible to develop projects within PURPA markets. You really saw that, you really had a vision for that, and I just want you to speak to that because that was something nobody else was doing at the time.

Stephen Shparber: 02:03:21 Yeah. And thanks. I think it was just, I saw it from the other side being in the market side. So, let me give a little more background on what we're talking about. So, if you look at this map... Thanks for putting it up, If you look at this map here.

Stephen Shparber: 02:03:35 Oh. There's no laser pointer? No. Okay. I'll just talk and point. Anyways.

Zoë Gamble Hanes: 02:03:41 Yeah. The red button.

Stephen Shparber: 02:03:45 Thanks. Okay.

Stephen Shparber: 02:03:45 So, here's the map of the US. The shaded areas are the deregulated markets. The non-shaded areas are the regulated market. And then the way this is there, the orange are the projects under development. Yellow are what's already in the ground. So, the solar industry, when costs were high, you needed some form of regulatory way to go and be cost effective. Regulatory means to be cost competitive.

Stephen Shparber: 02:04:22 So, a lot of the solar development that happened in the Southeast, in North Carolina, which Zoe was instrumental in helping to effectuate, really developed under PURPA in a regulated framework. And basically, what PURPA does—not to take too much of your thunder, Catherine—it was passed in 1978, and it opened up competition for the first time in the US power sector. And it mandates utilities to actually purchase power from certain types of facilities, renewable energy and solar being one of them. But basically, a regulated mandate that both forces the utilities in certain instances to purchase power. And if you see here, especially the yellow, a lot of what is driven in the Southeast was all around, especially in North Carolina is all PURPA, and also California as well.

Stephen Shparber: 02:05:05 There are other important issues like tax incentives, things of that nature. But at the end of the day, the reason why it's not about the market's very important is because legally, you may not be able to actually sell to anybody. Or it may be very hard to actually get a get an off taker. So, in the regulated markets, that really is what drove the development of solar, especially the last decade or so.

Zoë Gamble Hanes: 02:05:29 And can I just interject? For those of you who don't know, the reason why is that in North Carolina—every state can interpret and implement PURPA for its own state—and the North Carolina utilities commission mandated that that utilities, BiPAP or anything that was under five megawatts AC inside with a 15-year term, and every two years, the price reset. So, it was essentially a requirement to buy in a non-negotiated contract that was at a set price that everyone knew. And so, the only barrier to doing your assistant bill was signing interconnection and ultimately financing, and in North Carolina there was a state tax credit and that became useful.

Jonathan Willson: 02:06:18 And you guys have the state tax credit in addition to the federal tax credits.

Zoë Gamble Hanes: 02:06:22 Yeah. And I think it's important because also that really worked to drive down costs.

Stephen Shparber: 02:06:29 And Zoe's is one of the main people of company that actually helped with that.

Zoë Gamble Hanes: 02:06:33 So thank you. Continue.

Stephen Shparber: 02:06:36 Oh. Question. Oh sorry.

Audience: 02:06:42 My question is about the power prices in North Carolina. I mean, I guess the state tax credit could help, but my understanding on PURPA is it avoided cost. And usually that's not high enough. I mean, it depends on where you are, basically.

Stephen Shparber: 02:06:58 So great transition to what the next thing I was talking about. So yes, over time avoided costs go down. And as, Jonathan, you were talking about earlier, if that's why, especially now it's tougher to get it contract. Ten years ago, avoided costs were also higher in North Carolina. That was just a function of the market at the time. As more just resources come on, not just solar, but in general, the avoided costs tend to go down. So, and that's also just any place that you have in the US, where there's more supply and demand and

more supply, prices go down. Same in wholesale markets, but especially in when the only calculation is avoided costs, the same thing happens. But now actually in North Carolina, there's been less development candidly. I was at PJM for 2014 to 2017, and I kind of saw this from the inside. I keep a breath of what was going on in the industry and saw what was happening.

Stephen Shparber: 02:07:48 But I also said, well look, the RTOs, first of all, it's two thirds of the country. And second of all, costs for solar and wind are coming down, and there are all these other potential revenue opportunities and just things that they're not taking into account, in terms of how prices are formed, in terms of how do you value the storage, how do you value ancillary services? These are all incremental energy, incremental revenue opportunities that a lot of renewable just companies, the people I came in touch with the PJM, just really weren't taking into account. And I talked with a lot of them just in the course of my job with PJM. So, I kind of put two and two together in my head and said, well wait a second, it's going to be really more important for the renewable energy if they want to grow sustainably going forward.

Stephen Shparber: 02:08:33 But they say it more in the RTOs. And like I think I said earlier, I thought I was going to go to a growth-stage company, a solar developer or something like that, and go in there. And with all due respect to solar, I think it was like about a year or two too early, because I talked to a few of them. They're like: what are you talking about? But, then I said well I'll do it as outside counsel.

Stephen Shparber: 02:08:51 So essentially what I did and what we did at Nelson Mullins was we started with our initial—and I talked to Catherine as well with DIA support, certainly—we had a group of companies that were interested in being the

first movers in 2018, to participate in the wholesale market. What I mean by that is to stay in the stakeholder process, be more abreast of what's going on with FERC.

Stephen Shparber: 02:09:13 Not so much even for merchant plans, but just to understand what was going, because RTOs, we've been talking about the markets. But, they're responsible for the interconnection process. They're responsible for transmission planning, which by the way, the biggest unknown is what your network upgrade costs are going to be. So, RTOs in the stakeholder process that happened, t[illegible]hey're entirely responsible for that. And I think as they were talking about the last panel, the of the capacity market design and seeing what revenues you're eligible for and not eligible for, that's all done at the RTO stakeholder level, and it's very important. And if you look at also where a lot of the red is, it's coming more and more in the RTOs. Texas is a huge market. There's a ton in Virginia and Cal ISO, SPP as well. Which SEIA is very focused on along with BJM.

Stephen Shparber: 02:10:02 And so more and more, especially as projects get larger, t as costs for solar panels are becoming more cost competitive with other resource types, wind, but also, just natural gas, and obviously coal. Being able to compete in an equal playing field in the RTO is important. The problem with the RTOs, and I use this analogy. And it's prevalent in the regulated markets as well. So, the whole power system and all the markets were set up about 20 some odd years ago roughly. That's when the RTOs is really came into fruition in the late 90s and early 2000s. But, there were set up with a paradigm of large central generation. And the market rules in the operation, and the planning protocols were all set up in a certain paradigm and in mind. And

it's like we're going from analog to digital, and renewable energy.

Stephen Shparber: 02:10:55 And renewable energy, a nd when you talk about storage and things of that nature, they look different, they operate different, their costs are different, they're output is more variable, they're financed differently because you don't have spark spread to worry about like you have natural gas, which is another financing opportunity. You have all your fixed costs up front. There's basically zero variable cost going forward.

Stephen Shparber: 02:11:21 So, the way that the market rules are set up and the planning protocols and the operations are set up in RTOs directly impact the value streams that are potentially available for you as a solar developer. And it's great that's happening in relatively short period of time. I think the solar industry has woken up to that fact. SEIA, as an industry trade group, has started to get more involved. Which is great because the numbers are... By the way, I had a much easier job than Catherine, because I just did five to 10 clients to work about.

Stephen Shparber: 02:11:57 They're like, yeah let's go and chip in on this. You have over a thousand. So, the only reason that, in 2018, we could represent this coalition of companies was because I had far fewer to worry about. You had many more, which was good. But now everyone's on the same page and working together, which is great. I think really... And I'll turn it back to you; I've been talking a lot.

Stephen Shparber: 02:12:19 Sort of the next frontier I think for renewables, everything in the RTO is everything besides the ITC. And you know, the ITC is important and tax policy in general will always be important for financing any sort of infrastructure in the United States. But everything else where you're talking about interconnection reforms, if you're talking about what your revenue streams are from

energy, for capacity, for ancillary services. When you're talking about adding storage to everything, that's all going to be driven at the RTO level. And in many respects, it depends on the RTO and we'll see what ends up happening.

Stephen Shparber: 02:13:01 But, in general I think, competition and deregulation is better for renewables on balance than being in the regulated jurisdictions. Now, there's some people that may agree or disagree with me on that. But I think on balance, especially where we're seeing the growth over the next few years, it's going to be the deregulated markets. Especially in Texas. And it's with wind as well. With Texas, there's more in MISO, SPP and PJM, there's going to be sniffing in growth as well.

Stephen Shparber: 02:13:31 And then the other thing I haven't even talked about in terms of the importance of RTOs is because, and I think that on the previous panel they're talking about this, but, state policies and regs and things of that nature that drive another potential value stream for renewables. They can come into conflicts sometimes with federal regulation, and I can get into that a little bit later if we have time. But, right now, in PJM over the capacity market and what we're into [inaudible 2:14:09] about in December, that could very much hamper or potentially, depending on what comes out, open up some more opportunities for solar and the value streams they are eligible for.

Stephen Shparber: 02:14:15 So this is all why there's a lot going on in the deregulated markets. Keeps us busy. Keeps Katherine busy, and it will create or destroy more or fewer opportunities for solar moving forward.

Zoë Gamble Hanes: 02:14:28 So you're speaking of revenue streams? You're saying energy is a revenue stream, or capacity is a revenue stream, [inaudible 02:14:36] is scalable as a revenue stream.

There's voluntary procurement of energy from corporations, bilateral contracts, and then there's mandated. We haven't even touched on community solar. I think this is really important when you think about your earlier slide of getting the 80 gigawatts installed a year. And you look at how much is in the country that have not yet been installed.

Zoë Gamble Hanes: 02:14:59 And when, if you're talking about reaching the kind of de-carbonization that this symposium is really about, this is really scratching the surface. But it's getting at what is fundamental and essential, and that is not a small growth trajectory. And I just heard on that panel, we've been talking about issues around citing and if you guys notice there's a Microsoft, right? The-

Stephen Shparber: 02:15:23 Yeah.

Zoë Gamble Hanes: 02:15:24 [inaudible 02:15:24] Tower development. They had [crosstalk 00:33:27].

Stephen Shparber: 02:15:26 Sorry. Yeah.

Zoë Gamble Hanes: 02:15:31 That was essentially wasn't able to get zoning.

Zoë Gamble Hanes: 02:15:35 And so it would've been a huge solar farm that would have supplied power to Microsoft. And as you may know, the data centers are huge emitters of carbon and the usage of electricity. And there's zoning, there's citing. I really do recommend reading this. The road map gets at a lot of these issues. But if you look at the map and you look at PURPA markets-

Katherine Gensler: 02:16:01 Well, I hesitate to call them markets.

Zoë Gamble Hanes: 02:16:00 ...versus-

Katherine Gensler: 02:16:02 I hesitate to call them markets. Regions.

Zoë Gamble Hanes: 02:16:04 Regions. You're right.

Stephen Shparber: 02:16:06 That's true.

Zoë Gamble Hanes: 02:16:06 You're right. I'm just curious, though. The final topic I wanted to talk about, and then we'll open it up for questions; I'm being told we

Katherine Gensler: 02:16:23 Yeah.

Zoë Gamble Hanes: 02:16:25 Even if it was someplace like North Carolina, where it's seemingly full, but really it's only barely penetrated. You look at all the yellow dots on North Carolina, but when you consider that it's a small percentage of generating capacity in the state, it's still quite small relative to what we need to get to. Even where we have been successful in regulated markets, what are issues that have been happening with PURPA, and where do you predict that going?

Katherine Gensler: 02:16:50 Sure. There's a few different pathways that we take in our approach to policy in regulated markets. There is the PURPA path, and it's a subset of the solar industry that really tries to participate as a QF and wrangle through all of the rules and filings and keeping up with all of the avoided costs and doing those transactions. But we also have, in the last three years, really had a focus on the PUCs, and we always have, but specifically, we have branched out into participating in the Integrated Resource Planning process. This is where utilities get to propose and the policymakers are deciding on generation decisions for the next 30 years. The planning window is usually 10, but the asset decision is 30 or 40 years. We can't achieve this kind of growth. We can't achieve decarbonization goals if entities are continuing to build new natural gas plants, right? This is a decided move to take market share away from other generation sources. Plain and simple.

Katherine Gensler: 02:18:10 The more solar that gets approved, or even other renewables, RFP, whatever kind of solicitation you want to craft it, that all starts not with the beneficence of our utility friends, but really at the regulatory level. We've seen RPS's, and some of those have had massive expansions, particularly in the last couple of years, but also, just making those mundane resource planning decisions of, "What kind of

generation do we build next?" and driving solar megawatts through that channel.

Katherine Gensler: 02:18:46 We've also participated in rate cases that usually has the most impact on how volatile net metering programs are, or just what the value of solar is to a particular homeowner or business owner based on the underlying rates that they are being served by their monopoly utility. Then, we've also been engaged at the state level in PURPA dockets to set QF rates, to address the big overhaul that North Carolina did, for example, sort of bounce back and forth between the PUC and the legislature in order to start making changes in the PURPA space.

Katherine Gensler: 02:19:29 We have emphasized at the federal level on PURPA that any changes made need to really maintain a focus on competition, on increasing transparency, and on the accountability factor. FERC needs to step up its enforcement and really tell states when they're doing it wrong. It has been a pretty high bar to get FERC to go out on that limb and say, "No, this is not acceptable." We're trying to push them toward more bright line tests so that is easy to see what's acceptable and what isn't. That makes it easier for the developer; it makes it easier for the state to know if they are or are not in compliance, and frankly, it should make it easier for FERC to just reaffirm things that they've already said rather than feeling like they are in squishy ground anytime somebody brings a complaint to them about the actions of a state.

Zoë Gamble Hanes: 02:20:25 Steve, what's your prediction on further deregulation?

Stephen Shparber: 02:20:30 Without giving anything that is attorney-client privileged, I'll say there's a lot of interest in the Southeast on this going on now. A lot of this is public, a large part because we've been talking about the promise for renewables. Another big problem with the

regulated model is if you basically have a monopoly that they will go and get a guaranteed rate of return, sometimes, those monopolies don't make the right decisions. In South Carolina, I don't know how many people are aware of this; anyone hear of the V.C. Sumner project, or Sumpter? Basically, the utility down there built what amounted to a $9 billion hole in the ground, and I'm not kidding. That will never produce a watt of power, and South Carolina rate payers are stuck with that cost for the next, I think, 20 years.

Stephen Shparber: 02:21:21 I think it's something like for the next 20 years, every South Carolinian is going to have to pay I think $15 or $20 every month on their bill just for that project. It's a huge amount.

Zoë Gamble Hanes: 02:21:35 This is what happens when you have a monopoly.

Stephen Shparber: 02:21:38 When you have monopoly.

Zoë Gamble Hanes: 02:21:38 It's concentrated on all being power, and they [inaudible 02:21:41] decision making within a state.

Stephen Shparber: 02:21:44 We complain a lot about and we talk about the wholesale markets and the issues with them, but at the end of the day, and maybe this is because I did work at PJM for four years, I still think open competition—and there's some problems what's going on in the wholesale markets, but I think on balance—the RTO model is better for Nobel long term, and also for consumers. Because of that, there's been some renewed interest, even coming from Republicans down there.

Stephen Shparber: 02:22:12 Actually, one of the largest proponents of solar in the Southeast is fire-breathing, Tea Party Republican from South Carolina who doesn't like the utilities, and he's the biggest proponent for solar down the Southeast. It really can be, and is, a bipartisan issue. There's been a renewed focus; we'll see what winds up happening. That's a multi-year

process, if there's any sort of deregulation in the Southeast.

Stephen Shparber: 02:22:40 In addition to that, going into the West, though, the California EIM energy and balance market has been expanding, and even if that doesn't go to a full-blown RTO, it's sort of this in-between model between having a deregulated wholesale market and not. But, that's been expanding throughout the West, and California is going to start operating a day-ahead market; I forget the year it's supposed to be happening. But basically, what that will do is open up for more market opportunities in the West as well in the area that's currently light right now throughout the West, which will hopefully present more opportunities for Noble.

Stephen Shparber: 02:23:21 I think it's happening, maybe slowly but surely, and we will see what happens.

Katherine Gensler: 02:23:27 As somebody who spent six years entrenched in everything that the California ISO did, and ever helpful whatever you want to call it, TransWest, West ConAg, GridWest, love the names, but those conversations that were percolating in the early 2000s, I think, have circled back around. There's been enough trust built up in the region to refresh the conversation. I don't think they're ready to move forward on anything yet. That's way too soon, but we can at least start that conversation again, and I do think that in the EIM is a good first step. I want everyone to be 1000% clear that it is in no way a substitute or akin to an RTO, but it is a helpful addition to the competitive space.

Zoë Gamble Hanes: 02:24:24 Well, I know now it's time for me to open the floor for questions, and I'm probably going to steal a little bit of time, making us go over our time. Just forewarning.

Audience: 02:24:36 Hello! First of all, thank you so much for talking about this. It's really invaluable to hear from people who have been deep in the solar

industry from a variety of different perspectives and over a long span of time, seeing it evolve in such rapid manner. Thank you.

Audience: 02:24:53 My question is about a different policy that also has had a pretty productive act, especially in the last year, which are tariffs. My question is a lot more general; it's mainly for Katherine, but also for Jonathan working for the developer even if you want to contribute your perspective to that, which is, what has, in your view, been the impact of the tariff on solar modules that are being imported from China? Has it mainly been negative, driving up ETC costs? Or, have there maybe been some unintended benefits to, maybe, American-based solar module manufacturers? Overall, what do you think the impact of the solar tariffs has been on the industry, and what kinds of changes do you expect will happen in the future with regards to that?

Katherine Gensler: 02:25:53 Sure. Funny you should ask, because we basically owe that report to the International Trade Commission later this year. They do a mid-year evaluation where they ask exactly that question, "How are the tariffs working? What benefits have we seen? What harm has been done? Should we keep them in place?"

Katherine Gensler: 02:26:13 We estimated that tariffs would, overall, cost the solar industry about 8,000 jobs. That was pretty accurate. I don't remember anymore how many-

Stephen Shparber: 02:26:22 Was eight. Was it eight?

Katherine Gensler: 02:26:25 Yeah. Pretty sure. That's okay. No, no, no. Eighty was if the full thing went into... right.

Katherine Gensler: 02:26:35 We definitely saw the cancellation of billions of dollars of projects and commensurate job loss on the whole 40 industry. There have been some announcements and some openings of domestic manufacturing supplies, but by and large, what we have in the United States, as great as it is, is simply not enough

volume. I got to tell you, super not enough volume for this chart. Manufacturing is a piece of that decade-long solar roadmap because we want to be able to better match just the volume of solar supplies as well as demand for installations. Jonathan, I would love to hear what's been your direct impact as a developer.

Jonathan Willson: 02:27:25 I've worked at two large companies that have now made safe harbor investments and needed to kind of plan out their portfolios around the tariffs. They weren't a big deal. The issue wasn't cost or where the panels were being manufactured. The issues were timing. Could the free market deliver a functional supply chain in time for me to deliver my project along my GIA timeline and my PPA execution? This was especially pronounced for PURPA projects that constantly has to have the rates changed. In markets, like for NextEra that just has tremendous amount of market force, they just told Hanwha to build more modules. When Hanwha didn't want to do that in Georgia, they had Jinko just move to Florida and build a facility. It impacted some PPAs, but you just moved it down a year and beat down all of your EPCs and everybody else to make sure that they made up the difference.

Jonathan Willson: 02:28:31 It wasn't that big of a deal. Certain projects definitely got hurt. Some companies that had really aggressive financing strategies and were kind of a house of cards got knocked down. That was to be expected, but the more competent companies, it wasn't that big of a deal. The most imminent example, we just made a safe harbor investment or, are on the way to executing the contract right now. We didn't bother with modules at all. We felt like the cost declines of modules made it so, "Why would I buy them until right before I'm going to build my facility if I can?" We looked at

racking, inverters, 34-and-a-half kV supply cable. Inverters are really the big-ticket item. We called the inverter manufacturers. They said, "We already moved it all to India anyway. It avoids the tariffs. It doesn't change our pricing. It actually is a little more pricey if you buy it from China." They scaled up their manufacturing in time because they anticipated India's solar market to heat up faster, but poor policy design in India has made those auctions kind of not live up to the dreams.

Jonathan Willson: 02:29:45 Most manufacturers that were intelligent and had a large balance sheet already had moved their manufacturing or, could move it really fast, and then had slack demand in their supply chain because of markets overseas not developing as fast as possible. It didn't impact the pricing, really, at all. It's just where do you take possession of it, and what are the shipping costs to get it home? If you can navigate that, it wasn't that big of a deal. It hurts certain specific projects that had specific COD windows that they needed to come online, but within a few months, we kind of all figured it out, and that's kind of the beauty of the free market. It just corrects itself pretty fast.

Katherine Gensler: 02:30:24 Yeah. I think that's true on the supply chain side and being able to choose from multiple suppliers. Certainly, our overseas producers did not have that same level of flexibility, and I know one company, their North American CEO said, "Every Friday of last year, I authorized a check to the United States Treasury" – which is that customs import duty – "of six figures. Every Friday before I went home." The sum accumulation just to move their product into the United States, curbs their previously existing business plan in the tens of millions of dollars. That was a direct hit to their bottom line, and certainly, not all

of that could be recovered from their purchasers, from their customers, so some of that came out of profit.

Jonathan Willson: 02:31:20 Yeah. Really nobody, besides the inverter manufacturers at this point in the solar industry, is particularly profitable. We've just beat down the pricing everywhere.

Jonathan Willson: 02:31:29 When the tariffs went into effect, we beat them down, and the inverter manufacturers and the module importers all took a hit on their bottom line, or we canceled projects, and they didn't sell anything. They didn't get a lot of the development in other overseas markets that they expected, and so they just had a glut of manufacturing capability and were unwilling to give up market share, so they just met whatever requirements we needed of them.

Jonathan Willson: 02:31:54 Right now, some of that has flipped because they have now, within a couple months and years, figured out their supply chain, and now I can say, "You'll take whatever we give you because you need to safe harbor it, so here it is. Here's our spec sheet; here's our price. You need to sign this in two weeks. If you don't, somebody else will buy that capacity." It gets flipped back around.

Jonathan Willson: 02:32:15 It's a fluid situation, but I think, kind of perversely, we might have a more robust supply chain globally for equipment because of this. I don't like the tariffs, obviously. If the tariffs went away, I could probably take a couple of bibs off my pricing, but overall, pricing's not going to move that much based on the equipment costs. It moves on the ITC, and it moves on how expensive tax equity and back leverage financing are and network upgrades are.

Zoë Gamble Hanes: 02:32:47 I feel like I'm getting an eye from the back that says that I need to say-

Audience: 02:32:52 One more question.

Zoë Gamble Hanes: 02:32:53 We have one more question. Okay.

Audience: 02:32:56 Yes. Hi. Sylvia Bartell. We've hard a lot of talk about PURPA, but not a single piece about the recent notice of proposed rule making from the Commission. I'm really curious to hear, obviously, quick thoughts on it from each of you.

Stephen Shparber: 02:33:13 You want to go first?

Katherine Gensler: 02:33:17 Yeah. We've filed thousands of pages on PURPA at this point. Boil it all down. Listen, the commission missed half of the legislative record on purpose. Competition is one of the key reasons PURPA exists. PURPA is an imperfect tool for competition. I would much rather see RTOs, competitive wholesale markets, but in the places where those don't exist, PURPA is the best thing we got. It's a crappy thing, but it's all we got.

Katherine Gensler: 02:33:51 We are focused right now on crafting one more set of comments for the Commission to read, and they will be brilliant, I promise you. Again, our goal here is really relying on competition to bring the best product at the best prices to consumers. We think that PURPA needs more transparency about how avoided costs are calculated, about who's getting these contracts. We have some specific suggestions for bright-line tests on say, what constitutes a LEO? When do you actually have a Legally Enforceable Obligation? What should the term of your contract be? Going back all the way to the beginning of this conversation, contract term so that you can recover the costs of your facility is really key and it helps to reduce your regulatory risk and your financial risk to have a longer term and collect those revenues.

Katherine Gensler: 02:34:50 PURPA is still an important driver of project development outside of RTO and ISO regions, and for all of the wonderful things that have happened in the electricity markets since 1978, I would postulate that in Georgia, Idaho, Wyoming, we are still living in the

1978 regulatory regime. Nothing has changed. Making PURPA match the facts on the ground and try to bring some of the best elements of competitive markets into fundamentally noncompetitive regions should really be the goal.

Stephen Shparber: 02:35:27 If I may add on, the thing I would add on to that, and I agree with everything you say, Katherine, this is a notice of proposed rulemaking that FERC passed – just for those may not be aware of it – to actually, really, fundamentally reform PURPA. It's supposed to give states a lot of flexibility, and they say it's opening up competition. The problem is, what they did is, they applied lessons from RTO markets to non-RTO markets, and there are a lot of other factors that make RTOs truly competitive, very much closer to free, open markets as you're going to get in the U.S. power sector and what we have for competition. And I think, for example, applying those reforms into existing RTO markets for PURPA isn't as big of a deal. For very small projects, there may be some issues, but it's not going to have a huge impact.

Stephen Shparber: 02:36:19 It will have very large impacts in the non-RTO regions. The problem is that PURPA sort of establishes, and Zoe you mentioned this, a floor in terms of what states can and can't do. Just trust me. States and utility commissions and utilities that have a lot of political capital and just plain capital to influence decision making, will try to go and get below that floor established by PURPA as much as they can. Not in every state, but it's in a lot of them. The problem is that, if you take the federal floor of what PURPA is, which could be pretty low and they give a lot of discretion to states in terms of how they enforce it. Basically, federal statute gives the states a lot of flexibility at how they implement [inaudible 00:02:37:08]. You take

that floor and lower it from here to here, states we'll probably try to take it down to here. Some States. That's really where the potential damage is.

Stephen Shparber: 02:37:18 Anecdotally, two days ago, our firm represents a group of South Carolina Solar Business Development association that's actually fighting for avoided cost proceedings that are going on in South Carolina at this time. The utilities' witness in that case, a few days ago, was quoting the NOPR as it were chapter and verse, saying you have to go and apply it this way and saying all the reasons why avoided cost needs to go down, etc. etc. That will happen if the rule becomes final. It's not so much that the rule itself has flaws in it, but I think the real danger, longer term, is going to be how it may be implemented by a lot of states. Look, if a third of the country doesn't have meaningful renewable development, this isn't going to happen, and we're not going to meet our climate goals. We're also just not going to have a very vibrant energy sector in the U.S., and that's really what the danger is. I'm not uplifting.

Zoë Gamble Hanes: 02:38:22 I actually believe the last few questions really highlighted what is essential about why this is so hard. It's that not only are we dealing with entrenched interests that are opposed to the growth of the industry, it is extraordinarily complicated. When you look at it, it's not just one thing. You're not manufacturing widgets and selling it. There are a thousand different factors that determine whether or not a project fundamentally has financial revenue stream. We haven't even talked about what's going to happen with capital markets, with average cost of capital and all those things. You highlighted the point that this is truly a global industry now. If China decides that they're going to build 80 gigawatts next year, we have a supply constraint in the market because

that's the max about the global manufacturing capacity right now. There's a bit more.

Zoë Gamble Hanes: 02:39:16 I will say that there are things that are completely unpredictable. My last hopeful note is that, when you look at this thing, people often ask me how come the prices declined so much? There's a whole lot of reasons for it. One of the reasons is because of the recession, and you will recall that everyone went nuts over Solyndra and the bail out of Solyndra. Ultimately, the loss of U.S. manufacturing for solar resulted in China purchasing all the intellectual property out of bankruptcy of U.S. manufacturers. That single event is what has driven down the cost of solar. We want to hold on to a very small piece of what, really, ultimately is the total growth of the industry when you look at the numbers for the number of folks who are employed in solar today, relative to the number of people who are employed in US-based manufacturing. That is not where the growth is going to happen. Nobody could have predicted it.

Zoë Gamble Hanes: 02:40:27 If you had asked me in 2008, should the U.S. be bailing out U.S. manufacturing for solar, it would have been a yes, politically. That would have clearly been the wrong decision, so we have no idea. There is technology and inventions and financial structures. It's utterly unpredictable, and the only thing that is going to really make it go is that there are people who are committed and scrappy and are willing to figure it out. There you go. Thank you very much.

PANEL THREE: FEDERAL AND STATE POLICY FOR ELECTRIC GRID CYBERSECURITY

Mark James: 02:41:07 Well, here today, when I looked at my life, I see more than 30 years of energy law experience, and that's just with Mike, if we keep going on down the panel.

Mark James: 02:41:16 Today, we are going to talk about cybersecurity. I'm Mark James. I am an adjunct professor and Senior Research Fellow at Vermont Law School, which means that I used to be an assistant professor there, but I've now moved on to the D.C. area. Like Kevin said, I have former students in the crowd and it's wonderful to see them and, former colleagues as well. Today's panel is going to take on the topic of cybersecurity. Trying to lay out a few questions, but the what, the why, the how, and the where of adjusting cybersecurity, and when we use that term for this panel, we're talking about operational technology. You have people who talk about OT and IT and ICS, and in the world of energy acronyms, we can keep getting more and more complicated, but we're going to be talking about operational technology.

Mark James: 02:42:13 We've got industrial control systems, the systems that monitor dispatch and ensure that lights stay on and everything is in the proper order and respond to different events, providing that resiliency aspect as well as the reliability, and the threats that are emerging to that as that system changes. Thinking about how we have a legacy. Our grid really is, talking about having the prior two panels to talk about natural gas and talking about solar power, our grid is a reflection of decisions and choices that have been made for the past 40 years. What we have today reflects that. What happens in 20 years will still have parts of decisions that were made today as well as elements of the decisions that were made 20

years ago and everything that's happened in that time period. It is creating some tremendous opportunities to decarbonize. The grid provides environmental and social benefits, addresses serious issues; it's also creating some very new and novel risks, things that we can anticipate and even more along the lines of Donald Rumsfeld, the "unknown unknown," things we were uncertain about of how that system will change as new technologies come along and we changed the attack surface.

Mark James: 02:43:35 Millions of devices have been connecting onto the grid, and hundreds of millions of more expected to come on in the coming decades. It really does change grid vulnerabilities to grid systems. As that attack surface gets bigger, the threat actors get more sophisticated, too. They get more persistent; they get more focused both in their frequency and their potency, in Ponemon Institute, of utility professionals who now believe that operations technology is the greatest risk of where threat actors you're trying to get on to. The question of a cyber attack is a not a question of if, but a question of when, which then becomes how do you mitigate and how do you respond. Hopefully, we'll have a little bit of time to talk about that.

Mark James: 02:44:41 Then, layering on top of all that, as we'll see as we go through our panels, we have federal jurisdiction and states commissions that are in play with this, and we have utilities and regional coordinating councils. We're all trying to work on this, so there are many fingers in the pie, and a lot of the questions are dry from a lack of information, just knowing what's on the system. What's visible; how do they interact together? By adding two pieces together, what risks does that create? How you add a third, and it changes everything. That type of visibility in answering those

kinds of basic questions will allow us to get to the more complicated and deeper questions about how to protect it. More importantly, where to invest, and, of interest to everybody in the intel industry, how to pay for it, the big question of, "Where's the money going to come from in the end?"

Mark James: 02:45:42 We're fortunate in the U.S. to have not had a major cyber-attack. There are examples elsewhere to look. Ukraine is probably the most well-known one. I just read yesterday that the U.S. has done some cyber countermeasures against Iran following the Saudi Arabia oil refinery attack. So there are examples out there, and if you talk to security professionals, they can go into a lot more depth with what's going on. We are also in a situation where the former Director of National Intelligence, Dan Coats—I'm not sure how many formers ago he is. It's fluid. It changes—in a presentation and a report in January said that the Chinese and Russians have a presence in our electricity and natural gas systems. So, terrorist groups and then criminals. If you tried to bite the head of the Baltimore [inaudible 00:30:46], you couldn't do that because they simply shut down and ransomed that part of the city.

Mark James: 02:46:52 On that high note, we have a wonderful panel. I'm going to do just very brief introductions, and then, let them get into the meat of the presentation. We have Mike Bardee, who is the former FERC General Council, for a period, director of FERC's Office of Electric Reliability, which oversees approval and enforcement of regulations for whatever reliability affects the security of the electric grid, as well as a Protect Our Power Advisory Board member. On that side, Vermont Law School has partnered with Protect Our Power. Our chairman, John Lang, is sitting here, and we will have another

advisory board member, Tom Ridge, come and do our keynote on a couple of major cybersecurity reports, one that came out April, one that's coming out in November. We are very glad to have Mike on our advisory board, bringing his expertise and insight.

Mark James: 02:47:48 Beside him is Lynn Costantini, who is the deputy director of the Center for Partnerships and Innovation, former vice president and chief information officer at North American Electric Reliability Corporation (NERC). A long history with NERC rules and writing all of those in the early stages and again a length of time involved in these questions and maybe some answers as well, too. Joining us at the end is Andy Dressel, who was a VLS grad of 2007, named associate director at Navigant, who started his career working with the Western Electric Coordinating Council and NERC as well.

Mark James: 02:48:35 We will get through this 30 years in the industry—I have no doubt about it—really focusing on NERC compliance, which is something that Mike is going to start us off with as he talks about the federal efforts on cybersecurity.

Mike Bardee: 02:48:49 Thank you Mark, and thank you all for letting me speak here today. I'll start with a very quick overview of what FERC does regarding cybersecurity. FERC oversees mandatory rules for cybersecurity and for the reliability to bulk power system. The authority there is actually split between FERC and the states. For reliability purposes, FERC controls basically the transmission and the generation over a hundred kilovolts, roughly. There's some exceptions either way, but that's the basic rule. The states regulate local distribution, which is something they have regulated for decades for rate economic purposes, and that was carried forward in

2005 when the reliability authority was given to FERC by Congress.

Mike Bardee: 02:49:44 NERC also has a role. The way it works with FERC is NERC proposes the rules, sends them to FERC. If FERC finds that they meet the standards, it will approve them. If not, it sends them back to NERC. FERC can't change the rules. They can only tell NERC to change the rules. FERC can't write the rules.

Mike Bardee: 02:50:00 Like say EPA or most of the other federal agencies, if they want a new rule, they propose it and then they write it. FERC can't do that in the reliability realm. It has to rely on NERC and give instructions to NERC to do that.

Mike Bardee: 02:50:20 Penalties basically, they're assessed by NERC subject to FERC review. FERC has its own independent authority, but it's rarely used. It's been used only for major events, like regional blackouts that have happened, at least in small parts of the country. Other than that, FERC has left the enforcement role to NERC. So, this scheme of relying on NERC to do the crafting of the rules and the enforcement, you know that it's a slow process because if FERC wants a rule, it has to first of all propose to tell NERC to do it.

Mike Bardee: 02:50:55 Then, it has to have a final rule. Then it has to wait for NERC. Then it has to have a proposal to support what NERC does, and then a final rule. So, months to a year. If you think about cyber security, you have to wonder if that's the most appropriate process for ensuring the reliability of the grid.

Mike Bardee: 02:51:19 It's also an open process, meaning that all of this, both at FERC and NERC is happening in a public venue. People can see the proposals. They can comment on them. They can find out what the agency and NERC are thinking. So again, it makes you wonder if this is right, but this is the model we have, and it's the model FERC has used for the last 10 or so

years to try and maintain the reliability and cybersecurity of the grid.

Mike Bardee: 02:51:49 I'll touch briefly on DOE and DHS. They do not have the kind of regulatory authority that FERC has, but they have very important roles. DOE is a sector specific agency. Obviously, Homeland Security has a broader mission involving sectors outside of energy as well. And they both have a large role either in research or information sharing or collaborating with the various industries to ensure that they're as much up to speed and doing as good a job as those agencies can encourage them to do. Not require, but encourage.

Mike Bardee: 02:52:27 So, let me talk about an issue that's pending at FERC now that raises one of the classic tensions in this area. In this case, it deals with how much FERC discloses when there are violations, violations of the cybersecurity stints. Those are called CIP violations, "critical infrastructure protection." Right now, FERC does not require NERC to disclose and FERC itself does not disclose the entity that violated the rules. The reason they don't do that is because of concern that that might make them more of a target for hackers or other hostile actors. If it were known that this company, in particular, was just found to have fallen down on the job, well, if you're looking for some place to start your malicious efforts, that might be the best place to go. So, they have not disclosed that in the past.

Mike Bardee: 02:53:25 But there are concerns about the lack of transparency of this whole scheme. People rely on the grid for most of their vital needs. And, if their local utility is the one that's down on the job, they might want to know that, to put pressure on their PUC or their legislatures or others to make them pick up their effort and do better. Right now, you don't even know who it is. So, there's been pressure to try and

rebalance, to come up with a better balance between transparency and security risks. And so, FERC and NERC's staff put out a proposal to at least name the entity and the standard that they have violated. Not the actual requirement of specific rule, but the rubric of it and the penalty that would be imposed for it. So, it would at least be a little more information than is out there now. This is just a proposal. Comments are due at the end of this month, and we'll see where FERC goes with it.

Mike Bardee: 02:54:27 It's a tension that comes up in a lot of areas of how much can you release publicly because the public is entitled to know what goes on with their basic electricity service or other vital sectors. But at the same time, when you disclose information you might be increasing the risks for security purposes.

Mike Bardee: 02:54:51 I'll touch on next an event that happened in the US system earlier this year, a cyber event. It had happened in the west, and basically it was a fire wall vulnerability. It was exploited. It interrupted communications between certain devices. It did not interrupt the supply of electricity or the delivery of electricity, but it did briefly interrupt communications, digital communications, between some devices and a control center. Just last month, actually a few weeks ago, NERC put out what they call Lessons Learned Report, which is basically trying to explain this to others in the industry so that they don't fall into the same problem. They can avoid it by learning from what happened with this company. And some of the lessons that came out of it were pretty basic strategies. In this case, for example, there already was a firmware update for this vulnerability. They just hadn't put it on yet. They hadn't updated it in their patch management yet.

Mike Bardee: 02:55:58 They also obviously put the patch onand then changed their patch management processes to be more rigorous, more timely. They also tightened their firewall access rules. They restricted what IP addresses could actually get into the firewall. It's a technique called white listing. Very valuable, but there are concerns sometimes on the grid that if you do it incorrectly, you might inadvertently cause something to go wrong on the grid at the wrong time. But, they felt confident that they could limit the firewall access rules and have done so in a way that they're comfortable is going to be appropriate.

Mike Bardee: 02:56:45 One other thing they found was that they had some of their facilities where they had basically dual firewalls. And those sites were unaffected in this incident. Basically, what happened was, one of them would get affected but its partner right next to it would continue the communications. So, they realized this was one way to strengthen their system. And then, NERC also pointed out some other classic techniques such as layering your defenses, segmenting your network, and monitoring your network. I mean, the basic takeaway for much of this is the basic techniques that have been talked about for a long time are really important. You got to do them right. If you screw them up, you can go wrong, even when you don't have a very sophisticated adversary trying to exploit your system.

Mike Bardee: 02:57:38 I'll talk next about a report that GAO put out not long ago this summer, talking about grid cybersecurity at the federal level, basically DOE and FERC. They did say that the capabilities of hostile actors are improving, whether it's a hostile nation, a terrorist, criminals. They're, getting better. They also said that the grid is getting more vulnerable because people are putting more remotely

accessible devices on the grid to operate it. I mean, those are great efficiencies, but they do increase the attack surface on your grid.

Mike Bardee: 02:58:21 Connections to business networks are also increasing. There have been some breaches into business networks, but none of them made it over into the operational side of the utility. And those connections are another path that someday might be used to do so. Legacy Systems are

Mike Bardee: 02:58:59 Supply chain risk are also something the industry is continuing to struggle with. Whether it's new software, whether it's patches sent to you by a vendor or a vendor person. Somebody from the vendor who has access into your system. And now, the growth of the internet of things, all the things that people are plugging in to the system. Many of those are at the household level. Refrigerators. We went and looked for new appliances when we bought our new house a year ago, and you can get a stove that's now on the grid. I can go on my phone and talk to my stove. So those are another vulnerability.

Lynn Costantini: 02:59:38 Because, why not?

Mike Bardee: 02:59:43 So basically, what GAO concluded was to make a few recommendations. One, to DOE. I won't go into it in detail, but basically, they said to DOE "you need to come up with a more comprehensive, strategic approach to grid cybersecurity" including a plan that has a much better assessment of what are the risks. There have been some partial efforts, some better, some less. But DOE has to try and do it more comprehensively and better.

Mike Bardee: 03:00:14 To FERC they said two basic things. One is to look at the NIST cybersecurity framework and see how it compares to FERC's CIP rules. The cybersecurity framework is a very comprehensive approach. It's written broadly because it applies not just to the utility sector but to all sectors. But it has a lot of good ideas

and techniques in there. The CIP rules cover are narrower segment of the kinds of things you can do and GAO just wants FERC to look at the NIST product, the cybersecurity framework and see are there any parts that you should be using that you're not? And then the other recommendation they made to FERC was to look at whether the geographically distributed parts of the grid could be attacked in some coordinated way. That means that your current threshold, the threshold now does a system control 1500 megawatts in the same place, basically. If it doesn't, it's considered low risk and subject to very few of the rules. If it does control that much, it's subject to the full set of standards. So, what GAO said to FERC was, look at what does that threshold still make sense in light of this risk of a coordinated attack on multiple small things, instead of just one or two big things.

Mike Bardee: 03:01:48 The agencies DOE and FERC both agreed with the recommendations, which they are just asked to consider at this point. So, their agreement doesn't mean we are going to do 100% of what you said. But they are going to consider it. So I think both of those for FERC are really good ideas to explore, whether they should be making the kind of changes here. And hopefully they'll find some ways to improve the rules that apply here.

Mike Bardee: 03:02:24 I'll touch briefly on a piece of legislation that was just proposed in the Senate by senators Murkowski and Manchin, and a few others. Basically, it goes to the idea of encouraging utilities, or facilitating them, in investing more in cybersecurity. One of the problems that many utilities have is they have a rate level. If they want to spend more on cybersecurity, they either have to start a rate case and open up their whole rate level to scrutiny, or they have to just write it off the bottom line as a deduction to their net revenue

and net profits. And this would direct FERC to have rules on rate incentives for advanced cybersecurity technology and also adopt additional incentives for the smaller utilities who have limited cybersecurity resources. And also, FERC would have to allow single issue rate filings. Meaning that if a utility wanted to spend say $20 million more on cyber security, they wouldn't have to open up all of their other expenditures to scrutiny. They could just put that in and try and justify that expenditure.

Mike Bardee: 03:03:43 And then there would be a program at DOE from 'munies and co-ops, most of which are not subject to FERC rate regulation. So again, if it makes progress in Congress, if it ultimately gets approved, would be one way to try and best address the barriers that slow down investment in grid cyber security.

Mike Bardee: 03:04:07 And the last thing I'll touch on very briefly, Mark referenced it. It's a study that came out from Seimens and the Ponemon Institute. It's really just a survey of grid cybersecurity professionals. He mentioned some of the highlights. I'll touch on just a couple others. One of the things the report described in compiling the results, the bottom line was that risk is worsening with the potential for severe financial, environmental, and infrastructure damage. They said that a lot of the respondents said their utilities really don't have a very good handle on their inventory of cyber assets.

Mike Bardee: 03:04:50 If you want to protect something, you have to know what you're protecting. What you have. And some of them are still struggling with that. Insider threat was something cited by a lot of the respondents. We always think of attacks from hostile nations or terrorists. But actually, a lot of the respondents to this survey said they worry more about insider threats.

Mike Bardee: 03:05:16 Finally, one of the things that a lot of people cited was the human capital issue. There just aren't enough people who are trained and knowledgeable at doing cybersecurity, particularly in the utility realm, and so they all compete for the same people. And that means that somebody is not going to get the right amount of good people to do the job well. So those are all consistent with things that I heard throughout my time at FERC, at the Office of Electric Reliability, particularly the part about human capital. We felt that ourselves, we had to compete with industry or the same people. It's just a struggle to get enough good people to make sure you've got the job covered well. So, I'll stop there and turn it over to Mark.

Mark James: 03:06:08 Thank you, Mike, and we will jump to Lynn. As she is getting her slides, she told me that she's an adjunct as a professor, teaching students in that specific area of security. You're ready to go.

Lynn Costantini: 03:06:30 Sure. So full disclosure, I am not an attorney. Nor do I live or work in Vermont. So, that's two strikes against it. But to earn a little bit of that credibility back, I do use legal pads. Truly, I use legal pads. But I've also been a cyber security professional in the electric utility industry for almost 30 years. I can't believe I actually said that number, but it's true. Again, full disclosure, I'm a cyber security professional who uses paper and pen. But that's thinking for a minute. Okay.

Lynn Costantini: 03:07:20 So, I have been asked specifically to talk about the role of the state in cybersecurity of the electric grid. I always want to make sure that we have our definitions straight and the definition of states in cybersecurity is very amorphous. There's a lot of state agencies that are involved in grid security. For example, state energy officials are involved in grid security, making sure there's enough fuel to power the resources within the state. The

departments of environmental protections in states also have a role here, how much you can generate over and above the requirements in a crisis. Department of Energy has a role too. Today I'm focusing on the role of the Public Utility Commission. Because of a lot of the things that you've talked about all afternoon, PUCs are in the eye of the hurricane, even with cybersecurity.

Lynn Costantini: 03:08:34 We insure safe, reliable utility service at affordable rates. That's the role of a PUC. Whether it's for generation resources or for cyber security investments. That's our job.

Lynn Costantini: 03:08:52 Just a minute on commissions, as well as Puerto Rico and Guam, and the US Virgin Islands. A plug for the program area in which I work within NARUC, The Center for Partnerships and Innovation. It's our job within this small group within NARUC to identify emerging utility challenges that might come before a PUC. We also provide expertise. We develop tools and resources for PUC commissioners and commission staff to use in the execution of their responsibilities. And we deliver training and education to help make sure that they make the best decisions for their consumers that they can.

Lynn Costantini: 03:10:04 We do this under the CPI umbrella in four particular areas: energy infrastructure, modernization, system transformation, critical infrastructure, cybersecurity and resilience. That's my portfolio. And then we also talk about innovation, hot topics like electric vehicles. That's probably the hottest topic right now. So, to your point about the division line between for FERC, NERC, and states is right there at the distribution. So, the generation and transmission, generally a hundred KV and above, that's considered the bulk power grid.

Lynn Costantini: 03:10:48 At the distribution substation, where the high voltage is stepped down for delivery to

businesses, communities, and homes, that's the distribution system that state public utility commissions are responsible for. That is our jurisdiction. The grid modernization that we talked about just a second ago, that's happening on the transmission, the bulk power side. We're talking about automation. We're talking about digitalization. That's happening on the bulk power side. Getting smart on that side. On the distribution system, we're also trying to get smart. But that's where a lot of that transformation that we've been talking about this afternoon is happening. That's where we're talking about the introduction of solar, the introduction of micro grids, for example.

Lynn Costantini: 03:11:48 I want to introduce a couple of truisms that were coined by my friend, Mike Asante, who really was a giant in the grid security area who just passed away a couple of months ago. This is what he said in a paper he wrote in 2009. Infrastructures are critical to security and represent a common good. Hence, utilities are a natural monopoly for that reason. We represent the common good. Utilities provide a common good. And that's why we have the regulatory structures around that, that we do. Because they're providing a public good, we enabled them to recover a return on that investment. A natural monopoly.

Lynn Costantini: 03:12:41 The other thing he said is infrastructures are built to last. Something that you just talked about. We're not changing grid infrastructure in and out every three years. 40 to 50 years is more like it, both on the bulk power system and on the traditional distribution system. A lot of those distribution substations, they've been there for a long time. And they will continue to be there for a long time. So, together these things mean that we are bolting on security to protect these devices. We are not securing by design. We are not

implementing secure architectures across any of our critical infrastructure.

Lynn Costantini: 03:13:37 Hold that thought a minute.

Lynn Costantini: 03:13:42 We've been talking about the new grid today. This is the new grid. We're talking about how we can include wind, solar, whether it's utility-scale solar, or whether it's a rooftop solar. All facilitated by the introduction of large-scale battery storage. What we want in States, what our consumers want, clean, smart, efficient, resilient and reliable service at affordable rates.

Lynn Costantini: 03:14:18 Another Mike Asante truism. Because we're bolting on, not securing by design and we're adding all of this new technology into the grid, the new technology itself introduces vulnerability into the grid. So, I'll ask a rhetorical question. Is the grid vulnerable? Yeah. History says that absolutely it is vulnerable. Started with Aurora in 2007. That was a demonstration project about how technology could be used to destroy a generator. Mike Asante was the architect of that demonstration at Idaho National Labs. Then we had Stuxnet. The US and Israel disrupting the production of nuclear fuel in Iran. We just talked about the two Ukraine incidents where control systems of distribution utilities were hacked. Breakers were closed. Consumers lost electricity in both of those events. One of the scariest new attacks is called TRISIS. And that was an attack on a security system within a manufacturing plant.

Lynn Costantini: 03:15:52 Forensic evidence suggests that the perpetrator intended to do bodily harm. It wasn't just bringing down the grid, it was hurting people in the process. That's a scary new threat. I promise the last Michael Asante truism. Regulations and mandates without investment and without action aren't effective. They're just not. So, what can we, as state

public utility commissions, do to drive that action, to ensure that investment is made where it needs to be made?

Lynn Costantini: 03:16:39 Public utility commissions don't have one single set of mandatory cybersecurity requirements like they have at the federal side. So, it's a state by state approach to cyber security. Some States have taken the legislative route. Some have taken the regulatory route. Others have taken what I consider a more strategic and a less formal approach to pushing utilities to make investments in cyber security. Doesn't mean it's a free for all, however. We're all working toward the same goal; reliable, adequate, safe utility service. This is where NARUC can help here. Because we exist to help public utility commissions make really good decisions on a variety of topics, when it comes to cybersecurity, we have put out some tools for them to use. Our original toolkit included a discussion of risks. Because cybersecurity really is an enterprise risk endeavor. It's just not an operational technology endeavor. It's just not a business technology. It's an enterprise risk.

Lynn Costantini: 03:18:10 So we talk about that. We put together a primmer of cybersecurity topics for public utility commissions. The last one was published in 2017. We don't necessarily or naturally have the cybersecurity vernacular resident within a public utility commission. Which is why we put that primmer out. This primmer helps PUCs talk to their utilities about cyber security.

Lynn Costantini: 03:18:41 And lastly, we put up what I call the Critical Infrastructure Resource Repository. And that's really a compendium of both federal doctrine and state doctrine around cybersecurity in the energy sector, just not the electricity sector. It encompasses natural gas, water, telecommunications, as well.

Lynn Costantini: 03:19:05 So, one of the most recent things we did was put together a brand-new toolkit comprised of five different tools for utilities to use to engage their utilities in conversations about cyber security, about cybersecurity preparedness, about cyber security response and recovery, because that's what equals resilience for the distribution grid.

Lynn Costantini: 03:19:33 So, the whole point was to turn a lot of that broad knowledge that we had helped them learn through the distribution of those other resources helps them provide tools that can turn that knowledge into real action. Because remember that's where Mike Asante said we need to be. We need to drive action. These tools, a lot of them, already exist in different venues in the energy sector. We tailored them specifically for application by a public utility commission. And we worked on them as a set purposefully to optimize their value to the utility, as well as to the PUC.

Lynn Costantini: 03:20:18 So, you might question why would these help the utility? It gives a utility awareness of what the PUC wants to know. What questions they're going to ask. Where their focus will be during a conversation about cyber security investments. And this is what it looks like. At the top, we gave them tools so PUC could create its own strategy for engaging utilities in the cyber security realm. Then we took the primmer, and we extended it to have contextual based questions for a utility both on their planning and process side around what they do in cyber security, and then their implementation. So, you say you're going to do it in policy; are you actually doing itTough question, right? And then we gave them a tool that they could filter all of those responses in to gauge how mature the utility cybersecurity program was. Modeled after DOE C2M2 maturity model, if you're familiar with that.

Lynn Costantini: 03:21:36 Again, we didn't create much of this out of whole cloth, but we tailored it to application at the PUC and the distribution utility perspective.

Lynn Costantini: 03:21:47 Another resource that we provided was a tabletop exercise guide. This guide instructs or demonstrates, I should say how, PUCs can build tabletop exercises to allow the utility to demonstrate that it has indeed, not only have policies, have implemented them, but they know how they work in real time.

Lynn Costantini: 03:22:19 And then finally, we put a glossary together. Again, the cybersecurity vernacular is odd. We use a lot of acronyms just like everywhere, I guess in the energy industry. But it's particularly vague in the cybersecurity world. So, we put a cyber security glossary together. And we also, then, take this model, these tools, and we go on the road with them. We go to public utility commissions and demonstrate to them how we intend these tools to be used in real time.

Lynn Costantini: 03:23:06 These are the things that NARUC is working on right now to continue providing that awareness. The education toolkit for public utilities to really do well in the cybersecurity space. We're working on an information sharing guide within a state. So, who needs to know what about cyber security threats and vulnerabilities, and when do they need to know it? Who do they need to tell? You'd think that's pretty straightforward. But I'm sure my federal partner will tell you it is a morass of uncertainty. Really. Who do you talk to when? We're also working on a guide to help public utility commissions overcome the workforce challenges that Mike had suggested exist, across the industry.

PART 6 OF 8 ENDS [03:24:04]

Lynn Costantini: 03:24:00 So, if the federal partners can't afford cyber security talent because the private sector is scooping them up, we at the state, we're even

at a lower rung of being able to attract cyber security talent. This is going to take a real creative solution, and we're going to be working on that throughout 2020. And lastly, information protection is a huge issue because you said everything is done in a transparent manner. Well, states have sunshine laws for that exact reason. To make sure that information that they have in their possession is made public.

Lynn Costantini: 03:24:43 Well, when we talk about information in the cyber security realm, we don't want it to be public. We don't want to paint targets on utility's back. We don't want to expose weaknesses in the utility system because, dollars to doughnuts, they're going to be targeted immediately upon publication of that information. So, we're going to be working with public utility commissions to see if we can find solutions to those challenges, as well. have to go backwards.

Mark James: 03:25:20 Go all the way backwards?

Lynn Costantini: 03:25:20 Yeah.

Mark James: 03:25:20 Go all the way back.

Mark James: 03:25:21 If Andy went all the way back, just the main point, kind of, publishing things could be the version of Russia-

Andrew Dressel: 03:25:27 Oh, oh, too far.

Mike Bardee: 03:25:28 You're looking-

Lynn Costantini: 03:25:29 That's right.

Mark James: 03:25:32 That type of access is a critical issue that needs to be addressed.

Andrew Dressel: 03:25:37 Okay, there we are.

Mark James: 03:25:38 Or you can begin to address any technical issues you need to think about, how do you move the information around, and where all those crop up? All right. Final panelist.

Andrew Dressel: 03:25:53 Sothings? And, what are we thinking about when we go out to utilities and work with them to help them improve, both their compliance, which might be the highest-level focus from certain elements inside the

company. Because what Mike was talking about earlier can carry a fine potentially of $1 million per violation per day, versus what's actually secure, because compliance and security are not one for one.

Andrew Dressel: 03:26:33 So, I'm trying to figure out where to look. If I'm not looking out at you, I'm sorry. So, here are some of the ways that cyber attackers can attack a system. There can be insider threats that Mike mentioned earlier. There can be spear phishing. So phishing is general application. Those are those spam emails you get about, you know, from your credit card provider. You know, there's typically lots of misspellings or they're fairly easy to spot, but spear phishing, they've done their homework; they know where you work, they know what organizations you're in, and so this is what happened with the DNC hack. This is what happened with the hacks at OPM and New York Times, and in Ukraine. They find out, you know, who these people are, where they are, what they do, who they're associated with. And so, they reach out to them as if they know you.

Andrew Dressel: 03:27:32 And while there still might be the misspellings, there might be strange attachments in the emails that come in. It's a very effective mechanism because you're really playing with human psychology. There's distributed denial-of-service attacks, or DDoS, in the lingo. What that is, it's just a flooding of the system and overwhelming of the system. And we also saw that in the Ukraine attack, it was a multimodal attack where they flooded their call centers with phone calls, so they couldn't even get communications out to start working on the problem. There's ransomware. This one makes the news quite a lot. Luckily it hasn't made it into the operations side, but if your corporate side is completely locked up, if your

corporate side of the network, and I'll talk about network segmentation here a little bit more than just a minute, y ou might have a real problem operating everything. There's password or privileged or personal information. Yeah, going blank right now.

Lynn Costantini: 03:28:41 Personally identifiable information.

Andrew Dressel: 03:28:43 Personally identifiable information that gets compromised that can be used in a spear phish or it could be used just to brute force attack your passwords or your password failsafes. You know, when you don't have your password, but they asked you, "What was the name of your first pet?" and they can figure that stuff out as well. And then there's a physical malware introduction and we saw that in the Stuxnet attack that Lynn mentioned earlier, where they actually had a physical USB drive that they entered into the SCADA network and unloaded the malware payload.

Andrew Dressel: 03:29:20 I think I skipped one here. There we go. Oh no. So, this is the guy you got to look out for, but really their uniform tends to look more like a military uniform. So, typically, when we're talking about threats to the electric industry, including insider threats, these are nation-states. These are well-organized, well-funded, sophisticated attacks. They're military units. The picture there of the wanted poster, I believe that's from the follow-up of the New York Times attack that was tracked back to a Chinese military unit. And the four that are on there are not randomly chosen. Those are the four that are cited most often in cybersecurity type events: Russia, China, North Korea, and Iran.

Andrew Dressel: 03:30:36 And so, what is operations technology versus information technology? So, information technology is really the stuff you're familiar with, your typical networks, your servers, modems, switches, firewalls. That's your information technology. But your operations

technology is different. A lot of it works on internet protocol IP, but it's what controls the systems. It flips switches, it feeds in information for heads up, real-time displays. It can trip relays, which also opens circuits, things like that. Tcall industrial control systems. And in that there's SCADA, that's the most frequent one. It's "supervisory control and data acquisition" that's kind of the hub that controls all the other pieces out in the field that move around. EMS, which is kind of a subset of SCADA, which where you think about for large operations. We have a California ISO's control floor there and so the EMS monitors tens of thousands of data points and transmission generation balance because everything needs to be adjusted at all times.

Andrew Dressel: 03:31:59 Programmable logic controllers. Those are the things that actuate movement there, what controls the SCADA will tell the PLCs to open breakers. RTUs feed the information back to the SCADA. And then there's also a whole world of devices, but there's also relays, circuit breakers, network devices. All ofsee, the one with the blue boxes, that's inside a substation house. Those are digital relays. What they do, they'll open a breaker. They have various different protection, protective functions, you know, they sense different things, a voltage frequency and they'll open up and clear faults and a lot of them re-close after they clear. That can become interesting when we start talking about cyber events. The other thing we see is just an inverter out in the field at a solar plant.

Andrew Dressel: 03:33:05 Som what are the basics of cybersecurity plan? I'm most familiar with the NERC CIP rules, the critical infrastructure protection rules. But you see a similar framework with NIST, which is the National Institute of Standards and Technology. You see similar

things with ISO 27,000. But, what does your organizational structure look like? How do you deal with cyber security issues? Is there a line of sight at the executive level? Do you have a CISO, a Chief Information Security Officer or equivalent, that's looking at these issues and can bring that level of weight to the CEO so that operational decisions can be made, whether that's funding new technologies or adding manpower or responding to emerging threats. Also, it's how do you roll out policies and procedures that address everything that's below. Access controls are key. And there's physical access and there's logical access and it's kind of like a castle on a moat. There are all these different layers.

Andrew Dressel: 03:34:20 They call it defense in depth. At the farthest layer most people can get in, but when you get down to your really critical devices, you want very few people to have access, both physically and logically. The architecture has similar kind of goal; it's multilayered. You want to have diverse and redundant features. As Mike mentioned about the communication event that happened earlier this year, it affected one site but not the other because they had a diverse redundant system. Because redundant, in itself in the cybersecurity world, generally doesn't work. Because if the tech works one place, they'll work in the other if you have the same types of systems.

Andrew Dressel: 03:35:01 And point protection, you're probably real familiar with. That's your Symantec, your McAfee things running on your devices. Vulnerability management. You're also familiar with this one, though you might not be aware of it. Wupdates, and there's often some additional stuff jammed in there as well. But, by and large, there are security updates and that fixes holes in code. All code has flaws. The psychology of it as a little beyond

me. But if you have millions of lines of codes, you have lots of flaws.

Andrew Dressel: 03:35:45 Also, part of vulnerability management is testing your system. So, having cyber vulnerability assessments, penetration testing, these guys have fun. They go out, they pretend that they work at the power plants, and they try to get in. Or, they try to get access to the system logically and physically. They might show up as the pizza guy. Everyone opens the door for the pizza guy. Handout chocolate bars, you know, all sorts of things that. They like to have fun. They're an interesting group. Monitoring and alerting. You want to know system health. You want to be aware of what is flowing across your system. Mike mentioned white listing earlier. You should only have those channels open for normal and emergency use. But even across those normally open channels, you want to know, is there something unusual flowing across? Asudden, you're sending out lots of information or a lot of information is coming in in unusual patterns.

Andrew Dressel: 03:36:48 That should be detected. There should be alerting, heads-up displays to the people sitting at the EMS desk and elsewhere. Change control whenever you're putting in new software, new security patches, new firmware. That should be done in a very mechanical, methodical way, so that you identify potential risks and then you do a second check after it's been installed. Ahave to do this first in a test bed, a non-production system that's separate, although that's not a fail-safe. There have been problems with that as well. But the most important thing about all these OT devices is that they're reliable. They can't have interruption. So not only are we worried about security, but we're just worried about their day to day operation.

Andrew Dressel: 03:37:51 Mike also mentioned information protection; that's key. In many other industries, this is the entirety of cybersecurity. You're trying to protect your information. You know, cyber security is different in the electric world. There's nothing to steal, then you don't have criminals looking to get anything. You have people that are either just plain malicious or they're in some kind of national power struggle with all of us. Supply chain management. That's been an increasing concern. And as Mike mentioned, it's not just what devices you get, it's also how those devices are updated. Do you know where that update is coming from? Anyone who's providing services to you, do you know who it is?

Andrew Dressel: 03:38:46 And this is going to address not only machine and device procurement. There's software procurement, there's vendor procurement, but there's also, even when you're talking about machine-to-machine communications, there needs to be some kind of way to interrupt, monitor, and disconnect that exchange of information. Incident response planning. I've heard many defense people say that we're living left-of-boom, and it's not a matter of if, it's when. So, when we get to boom, how do we get beyond it? And so incident response planning and backup and restoration planning, it's really how do you get your systems back up? And this is a complicated process. Not only do you have to get your systems caught back up, but we live in an AC world, alternating current world and everything needs to be sync together. So, you have to bring things up a little bit at a time and piece by piece and make sure that you don't create more problems.

Andrew Dressel: 03:39:53 And then something that's come up, in both Lynn and Mike's presentation: information sharing. We have a special alphabet soup for

this one. There are many organizations that are focused on information sharing. And so, this is putting out information about vulnerabilities for the firewall that had that communication event earlier this year for critical updates. They put out mitigating measures, what you should do if you have one of these, but you can't patch right away. These are things like the Electric Sector Information Sharing and Analysis Center. We have the, the CRISP program, which is run by the DOE, which is the "Computer Risk Information Sharing Program." And there used to be a whole bunch of these things called CURTs, the "Computer Urgency Readiness Teams." And, beyond just information sharing, they can come and help with the response.

Andrew Dressel: 03:40:57 So if a smaller entity got attacked, there would be similar to a mutual aid that we're talking about when there's a hurricane and they line up trucks in Alabama to drive into Florida. They're looking to really institute a similar program for cyber readiness for those that aren't quite fully staffed or adequately staff. Because we talked about the federal and the state level. A lot of these municipalities and co-ops, they're very rural and they have very small budgets and it's really hard for them to get the right level of personnel. So, challenges in implementation: a lack of understanding, especially at the executive level. I think that's changing. We see that with the Siemens Report, also Utility Dive puts something every year in the last two years or three years with the biggest risk cited by industry executives was cybersecurity.

Andrew Dressel: 03:41:57 Evolving threats, the internet of things, the growth of the attack surface, evolving technology, evolving regulations. Maybe those aren't evolving quickly enough. On the bulk level, we're looking at, not exclusively, but a lot of them were written in 2012 and

things like virtualized systems weren't really addressed. Workforce shortages, we've talked about that a lot. Often cyber security is viewed as a cost center. You know, "what am I getting out of this investment?" So, as Lynn and Mike had mentioned, and as Mark had mentioned as well, paying for this is a big source of pain. And finally, organizational culture. While the mandatory reliability standards for the bulk system have been around since 2008 for cybersecurity, there's still resistance within organizations to show their work. "Well, I'm doing it, why do I have to have evidence that I'm doing it?" And, and that way you can't really assess whether they're secure or compliant. So, that makes it quite difficult. I tried to go as quickly as possible, but I think I'm at the end here.

Mark James: 03:43:20 Thank you. I've been given instructions that we have until 5:30 and then they hard-stop for our keynote speaker. So that gives us eight minutes to cover everything about cybersecurity. So, if there are any questions, please raise your hand. I think it's interesting that you guys to go down the granularity required at certain levels in this industry to talk about it. How do you protect utilities from their own employees' behaviors to coming up to the higher levels, how you create sufficient visibility without adding to the risks that already exist? Those two levels create some unique challenges.

Andrew Dressel: 03:44:07 Part of the insider threat is not just people acting maliciously, it's just them not acting fully aware. You know, clicking on a link in an email or an attachment. So, protecting people from themselves has to be somewhat as a goal of the ITOT groups.

Mark James: 03:44:29 I talked to t he guy that lead the research program at ECRI, the Electric Car Research Institute, and they do their own internal testing and they send out

spear phishing attempts to their own people and they said the first time, yeah, they get 12%. The second time, they get 6% of people who respond to it. The third time, they 3% then they go to their office and they talk to them. So, we have a question; Tom?

Audience: 03:44:56 Yeah, I just want to quickly thank the panel; this was a really great hour. One of the things that really strikes me about a big challenge here is that the main concerns really are these foreign entities and malicious action. And when you compare that to a lot of factors that we match for electricity, a lot of justification for things are for reliability, a lot of other actions are based on the clear benefit to the consumer.

Audience: 03:45:19 And so that, I think, really shows some of the big issues that we have with who's paying for this? Who really bears that burden? And we've seen some of those issues that I think you guys are going to talk about in terms of the federal government takes care of certain things. Traditionally, they are responsible for national security. So, having, especially I think a distribution of vulnerabilities in all these and even customers responsible for electric security is a big issue. So, I was wondering if I could talk a little bit about those institutional challenges that when we have to the internet of things and we have these new types of character resources, how's that really going to change responsibility? How do we navigate that to make sure that we aren't missing things, that we don't have vulnerabilities. This is how we set up our system.

Lynn Costantini: 03:46:02 I can take a stab at it. I really think it's a combination of a lot of the things that we've talked about. Within an enterprise and the enterprise risk management context, cyber security generally is looked at as a cost center rather than a profit center. But when you look

more broadly at the value that securing your infrastructure gives you, like you can continue to provide your service that is making profits for you, it makes a lot of sense. And something that Andy said is really, really important. Cyber security and the value proposition of cybersecurity is now openly discussed at board-levels and with CEOs. Up to, I would say a couple of years ago, it was always the IT people's problem to deal with, but now we're looking at it more as an enterprise risk and enter a risk to the business, not a risk to an asset. So, I think changing the conversation in that way has been very, very helpful.

Andrew Dressel: 03:47:15 Yeah, I would echo all of that. There's been discussion for a long time and Mike's probably been involved in some of the discussions, of how do you ensure that all these multitudes individual actors can work together cohesively as a whole? There's a good part to that too. Tsecurity, that's not on the mission statement of a certain, you know, Pepco or you know, Dominion.

Andrew Dressel: 03:48:21 So they're very interested in doing the right thing. You know, I think some of the efforts that we blew by about the information sharing. Some of them, there has been an effort to get security clearances for those at utilities and other organizations so that they could get information fed right to them from the NSA, from DHS, and elsewhere so that they can get that operational information as rapidly as possible and there's not a delay, and they can do that. But it's a challenge, and it's going to continue to be a challenge. But there are numerous efforts of entities to work together. And there's a whole other side of this that we haven't discussed, which is physical security of the grid. And there's efforts there. A So, there are efforts, it's just hard.

Mike Bardee: 03:49:36 The only thing I would add is we've got this institutional structure that's very complicated between three different federal agencies, 50 different state commissions, let alone the governor's office, the energy officers and everybody else and then 3000 utilities, some of which are very big and some of which serve 10,000 people isolated 30 miles away from the next town. And so institutionally, you're trying to get all these organizations moving in the same direction, cooperative, collaboratively, is a struggle. People try and generally succeed. But, think of cyber security where the weakest link in this whole system could be the one that is used to bring down an interconnection. So, the tiniest little utility that is connected to PJM in the mid-Atlantic region could be the path that somebody uses. So, it's really an ongoing struggle to get everybody in this industry to share the information they should be sharing and to work together. It has worked well so far, but it is going to be an ongoing struggle.

Audience: 03:50:47 I want to get a quick one in to see if we get a ton of hypothesizing going. I've been looking at a lot of the EER market rules going on and one that seems to have flopped a little bit is aggregation as a market participant, assuming that does go forward eventually. I'm curious how NERC and FERC would interpret whose responsibility it is to make sure those aggregators are following certain fiber guidelines and how would that trickle down to the aggregated individuals,also how do you deal with all these different water heaters, you have all these different battery systems. How do you then enforce the standardization across that so there's not little backdoors and, you know, say company A's battery. I'm not sure that was much clearer.

Mike Bardee: 03:51:46 Let me start by saying they have done aggregation of demand response and I don't

know the way that NERC has applied its rules to them. I just don't remember those criteria.

Andrew Dressel: 03:52:01 They largely haven't.

Lynn Costantini: 03:52:04 But there's progress.

Andrew Dressel: 03:52:05 Right.

Mike Bardee: 03:52:06 So, my sense is the DER, unless they cross some magnitude threshold, are probably going to be similarly off the radar for purposes of NERC and FERC. Some will cross the threshold. I don't know where that line is, but I think if it's anything like the rules that apply to the bigger components NERC's going to point the finger at the big entity and make them responsible for going downstream to the smaller entities they're aggregating.

Andrew Dressel: 03:52:41 I'd just add a little bit on. It seems like there's almost a need for something like a UL, an underwriter's laboratory or something similar for any grid connected device. I know at the DER level, SunSpec Alliance is out there trying to generate the solar standards, inverter standards, things like that. And they're working with the IEEE team that's rewriting 1547... I can't remember the other one. But, just to build in some level of security when you have an interconnected device, and from just a pure security perspective, everyone's nest and every other device should have password enabled. And so you can't just have one password and have a botnet, which has millions of computers that you essentially control, go out and hit all of them at the same time knowing that the default password; zero, zero, zero, zero and then they can get all those devices to work for them as well through something like a Distributed Denial of Service attack or something else.

Andrew Dressel: 03:53:49 Going to Lynn's point, secure-by-design needs to be everyone's responsibility. It can't just be the utilities and it can't just be the regulators.

Lynn Costantini: 03:54:01 But there are several bills. You mentioned one, the Protect Act. But there's a couple of bills in both the House and Senate committees that are talking about just what you're talking about, [OBJ]supply chain. How do we secure the supply chain? How do we do component testing like a UL does? Right now, that really is the burden of the utility that employs those third parties; that risk is their risk. They cannot transfer that risk to the third party. And NERC has explored that problem. Haven't found the solution yet. But again, I think it's going to be a combination. This is partnership. When we're talking about cybersecurity, we really are talking about collaboration and partnership because not one single entity can solve this problem on its own.

Mark James: 03:54:52 And you do see that the state commission level, you see them trying to grab even third-party suppliers.

Mark James: 03:54:59 The ability to create and try and structure rules about how to back your third-party suppliers. That's more services moved to being provided by them or being provided through a cloud service that, you are two or three layers down the road and you don't have regulatory oversight over it, nor regulatory control in place and that's a whole other side of vulnerability. We have a question.

Audience: 03:55:21 Yeah, hi. Is there any precedent where regulators get denied a utility's proposal or a request for a cyber security investment? And related to that, there have been policy moves lately to turn major software systems into a capital expense or utilities because that's now their major business, and how does that work for cyber security?

Lynn Costantini: 03:55:52 Both really good questions. Now at the state level, yeah. Cap-ex is rolled into rate base, but other soft expenses, like O&M, is an O&M expense. But we are looking at a variety of different rate mechanisms to apply

specifically to cybersecurity expenditures, particularly performance-based rate making with trackers for cybersecurity expenditures. And to your first question, the answer is anecdotally, no. There is no single authoritative source for that information. But in my conversations with utilities, in my conversations with PUC's, if, they can identify what a cybersecurity expenditure is because often in a rate case they're buried, they will be approved.

Mark James: 03:56:56 Interestingly, National Grid is coming up for a management audit and one of the things that our security is standing there looking at, as I was discussing with that a former student who's from Massachusetts, their IT program was described as being disjointed, unreactive, and I can't remember, there's a third term they used that was equally in line of just not having it, not being thought out, not being planned out, being cohesive and then coming back to what the kicker was, what's the benefit to rate payers? Again, Alex's point and to your question as well, as theseinvestments go forward, there will inevitably be this, come back again, but okay, it's been approved and now we need to come back and think about what is the value that they produce from that. And, dealing with the world of anticipatory threats of unknown consequence, to invest $35 million to avoid a $300 million, all of loss of life, economic value, it's always hard to prove that a negative and to demonstrate that value. But they always come back with, "Who pays for it?"

Mark James: 03:58:00 The rate payer, the taxpayer?" So. I keep answering all the tough questions today.

Mark James: 03:58:07 So I want to thank the panel and have you thank them as well. this has been wonderful for me and I hope that... I'm going to assume that everyone else has found it equally enjoyable. So, thank you very much.

KEYNOTE ADDRESS: THE HONORABLE TOM RIDGE

Kevin Jones: 03:58:22 ...where he became the first secretary of US Department of Homeland Security. Tom Ridge was twice elected Governor of Pennsylvania. He served as the state's 43rd Governor from 1995 to 2001 and currently serves as chairman of the National Organization on Disability and serves as co-chairman of the Blue Ribbon Study Panel on Biodefense as well as other private and public entities. Graduated from Harvard with honors and was drafted in the US Army where he served as Infantry Sergeant in Vietnam earning the Bronze Star for Valor, the Combat Infantry Badge, and the Vietnamese Cross of Gallantry. He earned his law degree from Penn State University's Dickinson School of Law, and he was one of the first Vietnam combat veterans elected to US House of Representatives where he served six terms and I'm very pleased to introduce Governor Tom Ridge.

Tom Ridge: 03:59:30 Thank you for the kind introduction. Thanks for a very warm reception. I don't know if you saw the brochure or whatever announcing that I was going to be here but it said "Keynote address." Well I'm going to spare you a lot of time and a lot of effort. There'll be no, "Keynote address," but I'm delighted to have the opportunity to have a conversation with you because I like the importance of the conversation, the informality of the gathering so, thank you. You can tell listening to my introduction, it's been pretty difficult for me to hold a job.

Tom Ridge: 04:00:09 Ridge can't hold a job, he's had seven different paychecks. The one thing you didn't know, I was a garbage collector at the State Park, we were the guys that left at 2:30. We didn't look too good, we didn't smell too good, but the cool guys had the white powder, the

white cream on their nose walking around with whistles. Those were the lifeguards. But anyway, they didn't pay... overcome that adversity, and you move on. First to the law school, then to the Institute.

Tom Ridge: 04:00:37 I'm very pleased to be associated with your work because I'm associated with Protect Our Power as well. We're very gratified by the strong relationship and particularly the quality of work you did in Phase One on securing the grid, so I just thought it was really important to identify that. I also think it's pretty interesting. I love the notion of the Institute for Energy and the Environment. I get the connection. A lot of people still don't, and then so I tip my hat to the prescient, almost aspirational view that the Institute has, so it's fascinating to have been associated with that as well. Been thinking about some of the remarks I'm going to share with you this afternoon, and is there a social hour where I'm going to... [laughter] That's good. That's very good.

Tom Ridge: 04:01:26 It had occurred to me... Seriously I thought about this. In different phases of my growth, just from a young man, a student, to political figure, to Cabinet Secretary, all these things, how my view vis-a-vis the world of electricity and everything else has changed just as I've grown, become more involved in, just life writ large, and then the world of politics. 330 million people in this country, how many do you think, when they flick on the switch, think about anything other than, "Will the lights come on? Will the grill, you know, the refrigerator work? Can I get my coffee done?" And beyond that, and I'm not being critical, but how many of you think that I have 330 million people, how many we have, that worry about anything other than reliability?

Tom Ridge: 04:02:32 Very few. Very few.

Tom Ridge: 04:02:37 And that group, how many of them really worry about, "What's the source of the generation? Nuclear? I don't know. Coal? I don't know. Oil? I don't know; I just want it there." And their interest in that probably grows over a period of time but when you think about the average consumer, so, all right, so I'm one of those folks. I want the lights to go on, I want the beer in the refrigerator to be cold. It's life amenities, you've got to have it. Suddenly you get into Congress and then you think, "Heaven, now I'm the Governor and I've got a public utility commission, that puts some really smart, able people, and several of them are lawyers, really skilled in compliance, really skilled in regulatory environment."

Tom Ridge: 04:03:21 Now what am I thinking about? Well, now I'm thinking about reliability. I'm thinking about cost. These are publicly traded... most of them are publicly traded utilities, so what's their cost recovery mechanism? And all of a sudden, now from the civilian who's flicking on the lights, I'm thinking as Governor and now I know the other thing I did is think about what as a kid or just a consumer, now I'm paying for it and I want it to be there, I want it to be reliable. I'll tell you one of the most intriguing personalities in my time. I was in Congress for six terms before I was Governor and you got coverage all the time. Hup in Erie, Pennsylvania. This was big news in Erie. He would get the cameras and he'd go, and he'd put a letter in the mailbox to me, his congressmen complaining about utility costs. They got covered.

Tom Ridge: 04:04:20 All of a sudden when you're in government and you're dealing with the PUC. They wrestled with it all the time, particularly the time when we know the infrastructure is aging or the challenges we have right now as we go from the Edison era of electricity to the

Google era. I mean that's a real challenge for us. So, all right, reliability. Now I'm thinking about cost. I'm thinking about the politics of the regulatory environment.

Tom Ridge: 04:04:49 Now I'm Secretary of Homeland Security. Well, once we get over, decide we have the Department, when we get inside and one of the things we have to do is we take a look at this great economy of ours and at the time we divided in 13 critical sectors, that fell into 16, but of all the sectors in the economy, of all the sectors that drive the world's largest economy, what is most integral to them all? I would say probably energy and electricity. So another perspective, and what are the risks attendant to it? Well, we know what they are, physical, weather, EMP, or geo-magnetic. We got that. Outside. I remember way back when we were doing, "Red cell." Oh, it's what it is.

Tom Ridge: 04:05:50 We get some really smart people who weren't necessarily counter-terrorism experts, but smart people saying, "If you had these tools, what would you do if this was a target?" And we would combine the physical attacks simultaneously with a cyber-attack. You can imagine the confusion that caused. So all of a sudden they were looking at it as not only as a utility issue and a regulatory issue, it is becoming a national security issue. August of 2004 I'm not going to ask you where you were. Pretty young crowd.

Tom Ridge: 04:06:27 Hope you weren't in an elevator, but 50 million people were hit by the Northeast Blackout with a period of a couple of days. It was hot and humid, really drained the resources. Everybody was amping on. I mean, they just had voltage up, higher than they've had it in years, and burnouts and all of a sudden [inaudible 04:06:49] caused a couple of trees to fall. Some lines went down. All of a sudden you get a blackout that lasted anywhere from several hours to a couple of

days. Now it's just a couple of bad decisions made and there are a couple of tree limbs falling south of Cleveland, Ohio.

Tom Ridge: 04:07:09 Look at what happened. That wasn't a concentrated attack of any kind. That was some human error; hot, humid day; you can overload on the system and a certain number of multiple causations resulted in that. But we did it in this world of managing the risk to the most important piece of critical infrastructure in America and how do you do it?

Tom Ridge: 04:07:39 And how do you do it at the same time you have to upgrade really antiquated... an antiquated industry. Now that's the bad side. The good side is as you modernize and if you can build in security, that's a good thing.

Tom Ridge: 04:07:58 Going to take some time. Everybody was so excited about the internet of things. Excitement, I mean the promise of that, and what it can do to productivity and profitability and enhance agriculture and health care, but every point is a potential vulnerability. So, whether it's 25 billion or 30 billion devices by 2025, the number is so big it's... And that's the environment within which critical infrastructure and the most critical piece of infrastructure must exist going forward. And the challenge, I think, is that I'm not worried too much about happiness. I mean, I'm not an alarmist. I mean people asked me after my first couple of months in Homeland Security, "You probably don't sleep much at night, if you can sleep." I said, "I don't sleep much, but I sleep well," because at least I know now the infrastructure, the men and women every day throughout the government trying to make us more, make us safer.

Tom Ridge: 04:09:11 But the grid. The grid. We know the Russians play with it. Listen, I was on the board of Exelon for a while. They worried about it? Absolutely. They're worried about modernizing at the same time they're trying to

do improve and enhance their cybersecurity. At the same time, they're trying to go to Illinois and to Pennsylvania and to Maryland to get rate increases so they can upgrade the architecture, enhance cybersecurity and at the same time keep the regulators and the consumers happy. That's a pretty complicated task in this world, and I'm not quite sure that the industry itself, particularly around cybersecurity, has been focused enough on educating the general public as to the potential costs of managing the cyber-risk associated with the most critical piece of infrastructure in America. You know, it is a dynamic environment. It's so much easier to play offense than defense in the cyber world. It is cheaper.

Tom Ridge: 04:10:29 Russians, the Chinese, the Iranians, even to a certain extent, it's primitive as it is, North Koreans, they're all playing around with it. Look, not only play around in our electoral system in the United States. The Russians played around in Brexit, they played around in France. They've been playing around, but these are new tools and make no mistake about it, the Chinese and the Russians and others take a look at our grid as being a key component of how this greatest economy in the world flourishes. You knock that down and you cause enormous physical damage, financial and economic damage, and depending whether or not it's ever done in association with any other kind of attack, God only knows what consequences."

Tom Ridge: 04:11:18 So I'm not breathless about this. That's a fact of life. We live in what I call the digital forevermore. The digital sun is never going to set. It's going to get hotter. That's just the way it's going to be. And so, when you take on this project and say, "Okay, this is the reality." An antiquated grid—we're modernizing it—is

subject to the greatest risk, I think today, is the cyber-risk.

Tom Ridge: 04:11:50 See the weather maybe, maybe down the road there'll be a nuclear discharge, you'll get an EMP that will knock it out. There might be another incident, the tree-falls, the limb-falls, and you've got a black out for a while, but the greatest risk, systemic risk is cyber. And so, what I think you've done is said, "Okay," I really appreciate the fact that you took a look at how some of the states are doing it. My only disappointment is you don't look at Pennsylvania. Come on, man. But that's good. I don't know if that's good or bad. But the fact of the matter is, is that I've always felt as Governor, you do take a look at how the states do things. Lessons to be learned.

Tom Ridge: 04:12:32 The highest form of flattery is emulating what somebody else did in another state, and frankly a lot of these critical issues—and you know my politics—but if it's a good idea, who cares whether it's Republican or Democrat Governor, Republican or Democrat regulatory commission? If they got a good idea and you can apply it... We did that when I was Governor across the board in a couple of areas and so I think the notion that you look to some states, about specifically what they're doing and as you get to phase two it's, "Okay, now here's what everybody should be doing," I tip my hat and I like that. I like the research model. How many of you were involved in writing that report? Do you know what I'm talking about here?

Tom Ridge: 04:13:11 I know you did. Did you write it all by yourself?

Audience: 04:13:13 No, the students. I had four students on Phase One and two students on Phase Two.

Tom Ridge: 04:13:19 But there's a great report. This group know what I'm talking about? I hope so. I mean it's a very thorough, exhaustive report.

Audience: 04:13:25 Pennsylvania comes up in Phase Two.

Tom Ridge: 04:13:28 Good. Good, good. I hope so. Lessons good or bad. I mean that's what's really important because there's much to be learned from how the states are doing it. But the reality is the biggest challenge that we have, I don't take are from hacktivists, I don't think necessarily from criminal organizations. This is such a critical piece of our infrastructure, the biggest potential threat, even though the hacktivist can cause mischief and the criminal organization can do this and we're in some work to be part of this down the road, just trying to extract the money...

Tom Ridge: 04:13:59 The biggest long-term, tactical and strategic event would be from a foreign entity and a foreign country, and we know primarily who they are, and so how do we go about managing the risk? There's a law of diminishing returns even in cybersecurity and you just have to accept that. And so, some of the early recommendations. Machine-to-machine information sharing, and AI is going to have a big role to play down the road in helping us oversee and manage the grid writ large. And what do you think we found is, the utility companies themselves pay pretty close attention to their own infrastructure but the grid itself, that distribution system, that's pretty vulnerable, initially. It's very important that you focused on that and I was glad that you did.

Tom Ridge: 04:14:48 When I was in—this is a quick anecdote, if you don't mind. A couple of years ago I was invited to speak in China, and there were a couple of thousand mostly young people. I suspect many of them spoke English, but I didn't have an interpreter. They wanted me to talk about Homeland Security and I couldn't very well as a citizen, United States or Cabinet member, talk about DHS and cybersecurity without talking about two things publicly. One was about espionage. I

was careful for my sake. I must have been pretty careful because I'm here, and I had to talk about privacy and it was really the espionage that concerned me. So, after it was all over, they invited me to have tea with the Minister of Information Technology and Security. 15 or 20 minutes into the conversation, talked to him, he acted as if he was interested in how we set up the Homeland Security and like... And he raised his cup of tea and he said, "Well, you know, friends drink tea and enemies shoot at one another." And I said, "Minister, I've done both."

Tom Ridge: 04:16:09 And then I will tell you—and this is the world you're living in—in an inscrutable faced, unemotional, started lecturing me about the notion that the Chinese would be hacking into America's infrastructure and stealing secrets. Can't make that up. Can't make that up. I said to the minister, and again, I think we need to understand this... I said, "Minister, we teach Sun Tzu in our military academies."

Tom Ridge: 04:16:42 And he once said, to paraphrase, "it's the only the enlightened leader and the brilliant general that tries to secure as much information as possible before the battle will ever obtain victory on the battlefield." So, let's look at this. You're looking over our shoulder, we're looking over yours. Let's take the conversation elsewhere.

Tom Ridge: 04:16:59 The fact of the matter is, is that our enemies, we recognize this, not just only playing around in our elections, they're playing around in the digital forevermore. They see it as a tool, actually of harassment, actually of threat. Also, a tool that done either independently or in conjunction with more traditional weapons could cause great harm to their enemies. That's the reality. But we have capabilities too. We're not pretending...

Tom Ridge: 04:17:30 One thing I try to remind people, we have watches, they have time. Big difference in

their mindset. And so, we have to be vigilant in a dynamic environment, which means the tools they have are changing all the time. They're pinging is hundreds of thousands of times a day; let's accept the reality. But the challenge when it comes to the grid is the challenge of convincing the consumer and the regulator and the companies that oversee this, that they need a permanent, sustained commitment in a dynamic environment, to deal with the cyber threat because of all the threats that they have to manage it's the most serious and the most consequential. One of the great lines in your report, first page or two, you say you call the cyber threat, "Low frequency, grave consequence, and high probability," or something like that. It's there and so I appreciate the scholarly research and the work that you and your students did on that.

Tom Ridge: 04:18:51 So, I don't want to belabor the point on cybersecurity. It's a risk that can be managed. It has to be managed. It's a little more complicated when it comes to the utility arena because there's so many different companies and so many regulatory agencies. That's why going on a state by state basis and hopefully coming up with some... maybe Phase Two says, "All States should be at least doing this," or recommending... Has to be some kind of metrics as well as to how we can measure our security and we're going to have to hold these folks accountable down the road, but it's going to be some work. We're very pleased to be associated with it. The extent that we can help you with Phase Two, we're looking forward to that as we had some my friends at Protect Our Power. We thank you. By the way, I might spend a little more time to talk about cybersecurity, this is a very interesting group. Social hour's down the road, but you

got me here. If you're doing a Q&A, I'd be happy to do it.

Tom Ridge: 04:19:49 I want to thank you. That's it. That's the keynote. You can read it.

Tom Ridge: 04:19:52 I thought about doing it as a big binder with a lot of pages and opening the first one and saying, "It is good to be with you..." It just doesn't work.

Tom Ridge: 04:20:10 Way back when, right after you leave the Cabinet, and I say this with gratitude, there are speake's bureaus in town that work with organizations around the country that actually paid people like yours truly to speak. This might be the closest I ever got to white collar crime. Now that just evaporates after a while. I've been out of politics for so long and out of government. Let's take a case. They invited me to speak once on TV so I was excited... But at the first speech I gave, I really worked hard. I mean words matter and I wanted it to sound... And I thought it was pretty good, but I didn't feel like... I called back on the times I've been in audiences listening to speakers and I much prefer the more conversational tone, it doesn't to be perfect, the syntax doesn't have to be perfect. You don't have to make complete sentences so, you're relieved of a keynote, but I'm happy to have the chance to share the knowledge with you. But do you have any questions from your audience here? Political or otherwise?

Tom Ridge: 04:21:23 Oh, by the way, one thing I also didn't tell you though, that I think we've learned and I wanted to get back to comment at the Institute for Energy and the Environment. There's some Republicans who believe in climate change and think that mankind does have responsibility to recognize there's some degree of both culpability and responsibility. Not to eliminate it because there are other factors other than humankind, but we are playing a significant role and that's the other

thing that was intrigued about the Institute for Energy and the Environment because they're so together and I wanted to tip my hat to the Law School and the Institute for putting the two together in that regard.

Tom Ridge: 04:22:02 Sir. I'm going to call you sir and tell you, hit me with what your question is.

Audience: 04:22:08 So, picking up on that last thing as you said. Is there anything about cybersecurity that makes it non-bipartisan?

Tom Ridge: 04:22:19 Well, that's a great question. That's a really intriguing perspective because I'm thinking about issues that are dividing us, which seem to be about all of them. I got to be careful how I to say this. There may be people who think that the Russians didn't interfere with our election, digitally. Maybe a couple of those, but I think, I think the answer ultimately is it could be one of the few issues that would generate the bipartisan support politically.

Tom Ridge: 04:23:07 It's a great question. So how does it translate into legislation that has an impact on what we're talking about today? Writ large and forget about other critical sectors but impact on the grid or on utility company. To date much of the... and I think it's been bipartisan and well I guess it's mainly bipartisan, but today the government has been more punitive than helpful, more punitive than aspirational, more punitive or maybe... I don't know what MERC has done, but I know the MPC and some others have taken a look at companies and said, "Well you weren't strong enough, you didn't pay attention to this, or you should have avoided that," and they've been penalizing. So, it would be good if, to your point, there was some bipartisan legislation, that said something as simple as, "Big-time tax credits to utility companies, etc. to invest."

Audience: 04:24:13 It's been a trend for so long on the Hill all to always do big packages and putting everything but the kitchen sink into one bill

and that's partly why I asked the question because it sounds like cyber should be able to stand on its own if there's bipartisan support for it and move it as necessary.

Tom Ridge: 04:24:41 I think it's interesting. There's some bipartisan support or additional dollars to the states to help them secure the 2020 electoral process and that's easy. Make responsible the Govs. We oversee that and I think there'd be bipartisan support for that.

Audience: 04:24:57 Sir, if you could stand behind the microphone. We apologize. Didn't even turn it on.

Tom Ridge: 04:25:02 No problem. Okay?

Audience: 04:25:05 Flip that little... little green switch on there?

Tom Ridge: 04:25:08 There you go. Can you hear me now?

Audience: 04:25:08 Hell yeah.

Audience: 04:25:09 Or you can put it down.

Tom Ridge: 04:25:12 You couldn't hear me before?

Tom Ridge: 04:25:16 [inaudible 04:25:16] which shows there is bipartisan support in increasing [inaudible 04:25:24] ... digital forevermore. The grid is permanent. It's going to be greener, planet's going to get hotter. That's just reality. Don't run from it okay. What do we need to do with the country to help individuals manage it? And from an institutional point of view, utility companies it's about, first of all, it's just making sure that the employees of that... it's about training and education. Technology, yeah it is important, but training and education is as important as the technology and staffing. Was a great question. I respect it.

Tom Ridge: 04:25:56 Yes Ma'am.

Audience: 04:26:04 Oh hi. Thanks for being here today Governor, and I'm really glad to hear that the Department of Homeland Security really does prioritize the-

Tom Ridge: 04:26:25 Well we did before.

Audience: 04:26:27 Or did prioritize.

Tom Ridge: 04:26:28 We understood there was a war but there were other things-

Audience: 04:26:29 The point is the health and safety of the grid is essential to American economic productivity and success and so and our continuing competitiveness going forward in an international world. And so my question is, we all in the press desire this very... With the science being unequivocal that climate change is going to lead to increasing inclement weather and more and more severe weather events like wildfires out in California or massive storms here on the East Coast, do you know if the Department of Homeland Security is taking that aspect of our grid security as seriously as they are the cyber threat because it seems like that's also a pressing issue that might be threatening American peace, democracy and productivity.

Tom Ridge: 04:27:24 Occasionally I know, I will tell you honestly in my limited time... I was there for a couple of years, it was not a part of what we dealt with, and my perspective, it's probably a multiple jurisdiction, Energy [inaudible 04:27:33] health should be up here in this. There's so many implications to climate change. I view climate change whether people like it or not as another a national security threat. The destabilization that occurs in certain parts of the world, whether it's famine caused by a drought, and you made a great case that climate change itself has created physical problems, destabilize regions and countries and create internal political problems. And so, people don't believe that, but I think it's also a national security problem. Anybody's probably paying more attention. Anybody's paying attention but had to deal with the consequences right now, probably the military intelligence community.

Tom Ridge: 04:28:31 I think it's regrettable and I say, "My friends"... "My Republican friends", I'm not willing to say it is the only reason the climate has changed. I'm sure there have [inaudible

04:28:41] cycle [inaudible 04:28:43] but let's presume there was. You cannot convince me that millions and millions of present of stocks, knocks, and carbon dioxide in the atmosphere is a good thing.

Tom Ridge: 04:28:55 And I didn't do that well in physics and chemistry, but if you create a layer, which basically what we're doing, it traps heat. Well trap heat in your house and put an ice cube on your kitchen table and see what happens.

Tom Ridge: 04:29:13 So, we know there's trapped heat, and we know the repercussions of the heat being trapped. The ocean's getting warmer. Talk to these geologists or if you talk to this biologist, a one or two or three degree increase in the temperature of water in certain parts of the world affects that ecosystem.

Tom Ridge: 04:29:36 I mean people far smarter than I am can go into great detail. So, I'm a believer without being as knowledgeable as maybe even some of you are. So, let's just get that reality and do what we can to reduce.

Tom Ridge: 04:29:57 I know in Vermont... Nuclear is probably not popular in Vermont. I'm a big nuclear guy. I'd be willing to do it. What is your emissions? We didn't have Fukushima Daiichi, when it came out and the President of the United States, the Governor were standing there watching TMI three or four days after they shut the plant down because we know how to build them, we build them safe. And how we're disposing of the material, I understand that's controversial-

Tom Ridge: 04:30:25 So, it's a great question. I think this is where there are multiple jurisdictional issues and it again has become part of that polarized political environment we have in this country. You either believe it or you do not. Nobody's willing to say, "Well, I don't know what's just causing the building to trap heat." Heat's having long-term consequences to our environment, but not in our... in future

		generation's going to... one of my family expressions... You got them going on this. There was a great native American expression that you've probably heard. "You do not inherit the Earth from your ancestors, you borrow it from your children." If you put that your responsibility is to steward the environment today, in that respect I do think you-
Tom Ridge:	04:31:23	...inherent the green of the Earth. I'm not sure that's more than 50 degrees-
Tom Ridge:	04:31:23	Wonderful things that have happened to it and we aren't necessarily leaving it in better shape.
Tom Ridge:	04:31:23	So, great question. That's right, we're ready for this...
Tom Ridge:	04:31:39	Hey y'all, it's happy hour at Andrew's, I am very thirsty, you know. Thank you very much, good to be with you.

THE RIGHT TO A CLEAN ENVIRONMENT IN INDIA: GENDER PERSPECTIVE

Gayathri D. Naik[*]

[*] PhD candidate at School of Law SOAS University of London. The author is a Commonwealth Scholar from India and holds BAL.LLB (GLC Ernakulam), LLM (SAU), and MPA (IGNOU).

I. INTRODUCTION

The watershed moments for the recognition and development of human rights mechanisms in international law were the creation of the United Nations in 1945 and the Universal Declaration of Human Rights (UDHR) in 1948.[1] Since then, the UDHR, the International Covenant on Civil and Political Rights (ICCPR),[2] and the International Covenant on Economic, Social and Cultural Rights (ICESCR)[3]—collectively the International Bill of Rights—have mainstreamed several human rights in the form of political, cultural, social, and economic rights. However, despite UDHR's significance in human life and the enjoyment of human rights, the right to a clean environment could not find a place in any of these instruments.

The right to a clean environment is an all-encompassing right necessary for the realization of other rights because the environment contains all life. If the environment is harmed then the future of every creature is also threatened, which is evident from the impacts of climate change.[4] Hence, recognizing and protecting the right to a clean environment demands significant attention. Any harm to the environment significantly affects its beneficiaries—including humans. Women who are responsible for managing their family often bear the first burden of any harm to the environment, such as in case of polluted water. Many societies consider women to be duty bearers rather than rights holders.[5] International law recognized women's rights nearly two

1. *See* G.A. Res. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948) (outlining standards for international human rights).

2. International Covenant on Civil and Political Rights, Dec. 19, 1966, 999 U.N.T.S. 171, art. 1.

3. *See generally* G.A. Res. 2200A (XXI), International Covenant on Economic, Social and Cultural Rights (Dec. 16, 1966) [hereinafter *ICESCR*] ("[R]ecognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world.").

4. *See* Chelsea Harvey, *Climate Change is Becoming a Top Threat to Biodiversity*, E&E NEWS (Mar. 28, 2018), https://www.scientificamerican.com/article/climate-change-is-becoming-a-top-threat-to-biodiversity/ (describing the threat to species internationally due to climate change); *Species and Climate Change*, INT'L UNION FOR CONSERVATION NATURE, https://www.iucn.org/theme/species/our-work/species-and-climate-change (last visited Feb. 17, 2020) (describing how climate change is going to impact species generally).

5. Kuntala Lahiri-Dutt, *Water, Women and Rights, in* WATER AND THE LAWS IN INDIA 275, 275–76 (Ramaswamy R. Iyer ed., 2009).

decades after adopting the UDHR.[6] Analyzing this issue from a gender perspective, do women enjoy the right to a clean environment? If yes, what is the content and scope of that right; additionally, who is responsible as a duty bearer?

The right to a clean environment, which has a conservation dimension, often faces concerns relating to the sovereign rights of countries to exploit natural resources within their territories, as well as to the right of developing countries to develop and to combat poverty.[7] The right to a clean environment has been widely discussed from various dimensions: as a substantive and procedural right, as a human right, and as a constitutional right.[8] These discussions have largely been anthropocentric and have not addressed rights of nature, but these ideas are presently evolving.[9] Few studies have analyzed these rights from a gender dimension.[10] This is especially concerning since women are more closely knit to the environment in their daily lives.[11] This article attempts to explore these lacunae while examining this right through a gender lens. Specifically, it addresses how women are represented in right to a clean environment debates and how that representation could be improved.

Societies around the world recognize the intrinsic, invisible bond that exists between environment and gender through their culture and lifestyles. For example, Earth is revered as Mother Earth in every society.[12] In India, while rivers are represented as feminine, mountains, air, and fire possess masculine characteristics.[13] However, women and their rights are sidelined in the political sphere.[14] Debates concerning the right to a clean environment and its relationship with human rights continue.

---

6. G.A. Res. 34/180, Convention on the Elimination of All Forms of Discrimination Against Women (Dec. 18, 1979).

7. James T. McClymonds, *The Human Right to a Healthy Environment: An International Legal Perspective*, 37 N.Y. L. SCH. L. REV. 583, 584 (1992).

8. S. Radhakrishan, *Development of Human Rights in an Indian Context*, 36 INT'L. J. LEGAL INFO. 303, 307, 311, 329 (2008).

9. *See, e.g.,* McClymonds, *supra* note 7 (omitting substantive discussion of rights of nature).

10. *See generally* WOMEN AND THE ENVIRONMENT 5 (Gender Unit, UNEP 2010) (inferring that studies have not analyzed environmental rights from a gender perspective.).

11. *Id.*

12. *Exploring the World's Creation Myths* (Nov. 13, 2005), https://www.npr.org/templates/story/story.php?storyId=5010951.

13. Kalyani Sardesai, *The River with the Masculine Gender, Brahmaputra*, https://heritage-india.com/river-masculine-gender-brahmaputra/ (last visited Feb. 26, 2020).

14. *See generally* Paula Baker, *The History of Women in Politics*, NAT'L CONST. CTR.: CONST. DAILY (May 11, 2016), https://constitutioncenter.org/blog/the-history-of-women-in-politics (explaining the lack of political focus on women generally).

India has developed a strong constitutional jurisprudence on the right to life, which includes a right to a clean environment as a prerequisite.[15] But, do these developments address the concerns and impacts of environmental harm on women or their need for a safe and clean environment? Article 21 of the Constitution of India assures every individual has a right to life.[16] The Judiciary has broadly interpreted this right to include many interrelated rights that have been carved from the right to life.[17] This article examines the right to a clean environment, which is derived from the guaranteed right to life under Article 21, from a gender perspective. Additionally, this article uses the right to water as a test case for examining the relevant gender dimensions.

II. RIGHT TO ENVIRONMENT: CONTENT AND CONTEXT

The UN Conference on the Human Environment in 1972 marked the beginning of debates on the human right to a clean environment.[18] The Conference recognized the need to prevent environmental degradation through increased state interference in environmental protection and conservation.[19] International conventions and declarations preceding the Conference were narrower,[20] only focusing on certain species or certain developed countries.[21] These narrower conventions reflected bilateral or regional trade interests[22] rather than environmental awareness.[23] The

15. *See*, *e.g.*, Virenda Gaur and Ors v. State of Haryana and Ors, Gaur v. State of Haryana, (1994) 6 SCR 78 ("Environmental, ecological, air, water, pollution, etc. should be regarded as amounting to violation of Article 21. Therefore, hygienic environment is an integral facet of right to healthy life and it would be impossible to live with human dignity without a humane and healthy environment.").

16. INDIA CONST. art. 21.

17. Court on its own motion v. Union of India, Suo Moto, Writ Petition, No. 284 of 2012.

18. U.N. Conference on the Human Environment, *Stockholm Declaration on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev. 1, at 45–48 (June 5–16, 1972) [hereinafter the Stockholm Declaration].

19. *Id.* at 37.

20. *See* Convention for the Preservation and Protection of Fur Seals, July 7, 1911, 37 Stat. 1542, T.S. No. 564 (discussing preservation and protection of fur seals); Convention Between France and Great Britain, Relative to Fisheries in the Seas Between Great Britain and France, Gr. Brit.- Fr., *ratified Jan. 14, 1868*, 57 BSP 8 (U.K) (discussing fishing on shared seas); Convention pour la Protection des Oiseaux Utiles à l'Agriculture [Convention for the Protection of Birds Useful to Agriculture], Mar. 19, 1902, 22 RECUIEL DES TRAITÉS 1907, p. 96 (Fr.) (discussing bird preservation); International Agreement for the Regulation of Whaling, opened for signature June 24, 1938, 53 Stat. 1794, T.S. No. 944 (discussing whaling regulation specifically).

21. Anita M. Halvorssen, *The Origin and Development of International Environmental Law*, *in* ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 25, 25, 28 (Shawkat Alam et al. eds., 2012).

22. DANIEL BODANSKY, THE ART AND CRAFT OF INTERNATIONAL ENVIRONMENTAL LAW 11 (2010).

23. *See* Edith B. Weiss, *The Evolution of International Environmental Law,* 54 JAPANESE Y.B. INT'L L. 1, 3 (2011) (noting the lack of development of international environmental principles pre-1972).

Conference spurred a truly global effort of environmental protection by encouraging the participation of more countries.[24] The product of the Conference, the 1972 Stockholm Declaration, not only upholds the rights of man to be in a healthy environment, but also reminds him of his responsibility to protect and improve the environment for present and future generations.[25] The Stockholm Declaration also led to the adoption of several international agreements on the environment and related issues.[26] This early Declaration spawned an increase in debates about and recognition of a right to a clean environment at international and national levels.[27] This section examines the content and context of a right to a clean environment. First, this section analyzes the right to a clean environment as both a substantive and procedural right before examining it from a gender dimension, the focal point of this article.

A. A Substantive Right

In light of an ever-expanding environmental and human rights crisis, there have been proliferations of environmental and human rights treaties at international and regional levels.[28] Discourses on the right to a clean environment since the 1972 Stockholm Declaration have brought attention to existing international treaties to examine how and to what extent this right is

---

24. *See generally* U.N. Conference on the Human Environment, Rep. of the U.N. Conference on the Human Environment, U.N. Doc. A/CONF.48/14/Rev.1, (1972) (explaining a global effort of environmental protection.).

25. *See* Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 8249 (discussing the abolishment of trade of endangered species); United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S 397 (discussing protection of international waters); Vienna Convention for the Protection of the Ozone Layer, Mar. 22, 1985, T.I.A.S. 11097 (discussing the protection of the ozone layer); Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, T.I.A.S. 89–101 (discussing the management and control of emissions that deplete the ozone layer).

26. *See* Takyiaw B. Prempeh*, The Importance of the Stockholm Conference to the Creation of International Law* (Jan. 22, 2017), https://takyiawprempeh.wordpress.com/2017/01/22/the-importance-of-the-stockholm-conference-to-the-creation-of-international-environmental-law-2/ (finding that the Stockholm Convention influenced topics discussed at the Rio Conference on the Human Environment and Development of 1992); Günther Handl, *Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration), 1972 and the Rio Declaration on the Environment and Development, 1992*, LIBRARY OF INT'L L. 1, 1 (2012) (finding that "following Stockholm, global awareness of environmental issues increased dramatically, as did international environmental law-making proper").

27. Sumudu Atapattu, *The Right to a Healthy Life or the Right to Die Polluted?: The Emergence of a Human Right to a Healthy Environment Under International Law*, 16 TUL. ENVTL. L.J. 65, 69 (2002).

28. Lawrence Susskind, *Strengthening the Global Environmental Treaty System*, ISSUES SCI. & TECH., Fall 2008, at 1.

realized through them.[29] Recognizing the right to a clean environment is crucial for the effective and meaningful enjoyment of that right. This section discusses what constitutes the right to a clean environment under different fields of law: environmental law, human rights, and constitutional rights. These fields influence decision-making processes seeking to ensure that an agency does not cause environmental degradation that can infringe on human rights.[30]

1. Right to a Clean Environment as a Constitutional Right

More than 100 nations have granted a constitutional right to a clean environment.[31] Human rights could be implemented at a domestic level, either through constitutional recognition or statutory mechanisms.[32] Recognizing human rights through a constitutional provision enhances the status of those rights for maximum protection.[33] In this case, a constitutional right to a clean environment could help encourage effective environmental protection by reducing activities resulting in environmental harm. It could also lead to an equitable distribution of access to and control of natural resources, and ensure that the state performs its duty to enact and implement environmental laws.[34]

As a constitution reflects the political and social spirit of a society, including a right to a clean environment within a constitution could imply the value and recognition that society provides to the environment.[35] A right to a clean environment is an "eco-centric notion as a human centred right,"

29. *See, e.g.,* The Minamata Convention on Mercury, *opened for signature* Oct. 10, 2013, 27 U.N.T.S. 17 (entered into force Aug. 16, 2017) (mandating the protection of human health and the environment from the adverse effects of mercury).

30. *See* Dinah Shelton, *Human Rights and the Environment: Substantive Rights, in* RESEARCH HANDBOOK ON ENVIRONMENTAL LAW 265, 265 (Malgosia Fitzmaurice et al. eds., 2011) (discussing the link between human rights and environmental rights).

31. James R. May & Erin Daly, *Global Constitutional Environmental Rights*, *in* ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 603, 603, 605 (Shawkat Alam et al. eds., 2012); TIM HAYWARD, CONSTITUTIONAL ENVIRONMENTAL RIGHTS 2 (2005); *see* James R. May, *Constituting Fundamental Environmental Rights Worldwide*, 23 PACE ENVTL. L. REV. 113, 114 (2005–2006) (discussing the growth in countries recognizing a fundamental right to a clean environment in their constitutions).

32. May & Daly, *supra* note 31, at 603.

33. *See* Ernest-Ulrich Petersmann, *Theories of Justice, Human Rights, and the Constitution of International Markets*, 37 LOY. L.A. L. REV. 407, 413, 416 (2003) (discussing constitutional provisions as they relate to human and individual rights in an international context).

34. DAVID R. BOYD, THE ENVIRONMENTAL RIGHTS REVOLUTION: A GLOBAL STUDY OF CONSTITUTIONS, HUMAN RIGHTS, AND THE ENVIRONMENT 52, 58–59 (2012).

35. Nicholas Bryner, *A Constitutional Human Right to a Healthy Environment, in* RESEARCH HANDBOOK ON FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL LAW 168, 170 (Douglass Fisher ed., 2016).

which implies that humans are rights holders.[36] However, if the rights are defined in terms of the whole environment and ecosystem, they could be incorporated as environmental values into the constitution.[37]

The ubiquitous nature of environmental issues, including its extent and complexity, requires coordinated actions at a global level and concerted political efforts at a national level to implement environmental protection through the highest possible means.[38] Including a right to a clean environment in a constitution not only ensures equitable distribution of materials, but also possess several advantages. Professor of Environmental Political Theory at the University of Edinburgh, Tim Hayward, points to five advantages: it engrains the societies' environmental protection values; promotes coordination and unification of environmental regulations in the state; promotes cooperation among states; keeps environmental protection above the whims and fancies of legislature; and enables public participation.[39]

Many constitutions have provisions related to the right to a clean environment.[40] These rights could be either be specifically environmental-protection related or utilized without specifically referring to environmental protection.[41] Both direct and indirect inclusion of this right could enable the fulfilment of the procedural right to a clean environment, including access to information, public participation, and access to justice in environmental matters.[42]

Various studies have shown that different factors influence the incorporation of this right in constitutions. Jefford and Millers highlight three types of constitutions where environmental rights have been included: (1) younger constitutions; (2) constitutions with strong economic and social rights; and (3) constitutions in countries that have adopted these rights prior to enacting its own.[43] Jeffords and Gellers call these three factors (1) generational effect; (2) opposition cost effect; and (3) constitutional norm

---

36. *Id.* at 172.

37. *Id.* at 172–73.

38. *See generally* Joana Castro Pereira, *Environmental Issues and International Relations, a New Global (Dis)order—The Role of International Relations in Promoting a Concerted International System,* 58 REV. BRAS. POLIT. INT. 191, 192 (2015) (explaining that environmental issues belong to the states and to all humankind).

39. HAYWARD, *supra* note 31, at 6–7.

40. BINOD PRASAD SHARMA, CONSTITUTIONAL PROVISIONS RELATED TO ENVIRONMENT CONSERVATION: A STUDY 1 (2010).

41. STEPHEN J. TURNER, A SUBSTANTIVE ENVIRONMENTAL RIGHT 27 (2009).

42. Philippe Cullet, *Definition of an Environmental Right in a Human Rights Context*, 13 NETH. Q. HUM. RTS. 25, 36 (1995).

43. Chris Jeffords & Lanse Minkler, *Do Constitutions Matter? The Effects of Constitutional Environmental Rights Provisions on Environmental Outcomes*, 69 KYKLOS 294, 311–12 (2016).

effect.[44] Sometimes historic factors like colonialism and the timeframe of drafting the constitution also matter.[45] For example, constitutions in South Asia, which are drafted in parallel to human rights development, contain numerous provisions of the Universal Declaration of Human Rights.[46]

Though the U.S. Constitution does not have an environmental rights provision, many state constitutions do.[47] Constitutions from South American countries—like Brazil, Argentina, and Columbia—have environmental rights enshrined in them.[48] In South Asia, as highlighted above, constitutions reflected attempts to evade past injustices.[49] However, many constitutions, including India's, did not originally include environmental rights. [50]

---

44. Chris Jeffords & Joshua C. Gellers, *Constitutionalizing Environmental Rights: A Practical Guide*, 9 J. HUM. RTS. PRAC. 136, 138 (2017).

45. Joshua C. Gellers, *Environmental Constitutionalism in South Asia: Analyzing the Experiences of Nepal and Sri Lanka*, 4 TRANSNAT'L ENVTL. L. 395, 409, 420 (2015).

46. *Id.* at 411–14.

47. *See*, *e.g.*, N.Y. CONST. art. XIV (preserving forests to be forever wild, establishing forest and wildlife conservation, and authorizing disposition or use of certain lands); HAW. CONST. art. IX, § 8 (declaring "The State shall have the power to promote and maintain a healthful environment, including prevention of any excess demands upon the environment and the State's resources."); ILL. CONST. art. XI (establishing the public policy of legislative and individuals' duties to the environment); MASS. CONST. art. XCVII (declaring "the people shall have the right to clean air and water, freedom from excessive and unnecessary noise, and the natural scenic, historic, and esthetic qualities of their environment; . . ."); PA. CONST. art I, § 27 (declaring "[t]he people have the right to clean air, pure water, and to preservation of natural, scenic, historical, and esthetic values of the environment."); MONT. CONST. art II, § 3 (establishing the right to a clean and healthful environment as an inalienable right); *id.* art. IX (protecting the state's environmental and natural resources, explaining water rights, and commenting on cultural resources); R.I. CONST. art 1, §§ 16–17 (regulating fishery and shore privileges, and preserving natural resources).

48. *See* CONSTITUIÇÃO FEDERAL [C.F.] [CONSTITUTION] art. 225 (Braz.) (outlining the right of all to an ecologically balanced environment); Sec. 41, CONSTITUCIÓN NACIONAL [CONST. NAC.] (Arg.) (outlining the right to a healthy and balanced environment fit for human development for all inhabitants); CONSTITUCIÓN POLÍTICA DE COLOMBIA [C.P.] art. 79 (outlining the right of every individual to enjoy a healthy environment); CONSTITUCIÓN POLÍTICA DE REPÚBLICA DE CHILE [C.P.] art. 19 § (8) (outlining the right to live in an environment free from contamination); POLITICAL CONSTITUTION OF PERU art. 2 (22) (outlining every person's right "to peace, tranquility, enjoyment of leisure time, and rest, as well as to a balanced and appropriate environment for the development of his life."); CONSTITUCION POLITICA DE LA REPUBLICA DEL ECUADOR [CONSTITUTION] art. 14 (outlining the right of the population to live in a healthy and ecologically balanced environment).

49. *See generally* art. 41 CONSTITUCIÓN NACIONAL [CONST. NAC.] (Arg.) (stating that repairing environmental harm is a priority); CONSTITUIÇÃO FEDERAL [C.F.] [CONSTITUTION] ch. VI (Braz.) (establishing ways to ensure compliance); CONSTITUCIÓN POLÍTICA DE LA REPÚBLICA DE CHILE [C.P.] ch. III art. 19 § 8 (ensuring the state will oversee the protection of the right to a clean environment); CONSTITUCIÓN POLÍTICA DE COLOMBIA [C.P.] ch. III art. 79 (stating that it is the state's duty to protect the environment); CONSTITUCIÓN DE ECUADOR [CONSTITUTION] 2011, art. 14 (declaring conservation and protection matters of public interest); INDIA CONST. art. 14–15 (mandating equality before the law); Consitución Política de Peru [CONSTITUTION] Dec. 29, 1993, art. 2 § 22 (granting the right to a "balanced and appropriate environment"); CONST. (1987), pmbl., art. II §§ 2, 4 (Phil.) (stating the purpose of the constitution). (showing examples of constitutions conscious of past injustices).

50. *See generally* art. 41 CONSTITUCIÓN NACIONAL [CONST. NAC.] (Arg.); CONSTITUIÇÃO FEDERAL [C.F.] [CONSTITUTION] tit. VIII, ch. VI, art. 225 (Braz.); CONSTITUCIÓN POLÍTICA DE COLOMBIA [C.P.] ch. III art. 79; CONSTITUCIÓN POLÍTICA DE LA REPÚBLICA DE CHILE [C.P.] ch. III art. 19 § 8; CONSTITUCIÓN DE ECUADOR [CONSTITUTION] 2011, art. 1; INDIA CONST. art. 51A § g (describing

However, environmental issues were later adjudicated under the right to life.[51] The subsequent section discusses in detail the provisions in the Constitution of India and the development of the right to a clean environment. Including environmental rights in the constitution is the best way to ensure access to resources, environmental protection, and sustainable development.[52] It also ensures that rights of nature are protected, since the right to a clean environment is accompanied by the duty to protect the environment.[53] This duty to nature, bestowed upon both the state and citizens, ensures the preservation of the quality of and options to access nature for future generations.[54] However, this right remains vague in most constitutions, where the provisions include language such as "every individual has the right to enjoy a healthy environment" and "it shall be the duty of every citizen . . . to protect and improve the natural environment."[55] It is not clear what the consequence is for violating that duty, apart from the penal sanctions included in environmental protection statutes.[56] If this right and its inherent duty is a constitutional provision, it is the highest right, and violations should warrant harsher punishments in the interest of both anthropogenic and eco-friendly development patterns.

2. Right to a Clean Environment as a Human Right

Arguments for recognizing a right to a clean environment are as old as the Brundtland Commission Report.[57] The Report of the World Commission on Environment and Development proposed a human rights status for

---

only citizen's duties to protect the environment, not a constitutional right to a clean environment); CONSITUCIÓN POLÍTICA DE PERU [CONSTITUTION] Dec. 29, 1993, art. 2 § 22 (showing that many constitutions do not have a specifically outlines right to a clean environment).

51. Lavanya Rajamani, *The Right to Environmental Protection in India: Many a Slip Between the Cup and the Lip?*, 16 REV. OF EUR. COMMUNITY AND INT'L ENVTL. LAW 274, 277 (2007);
Jona Razzaque, *Public Interest Environmental Litigation in India, Pakistan and Bangladesh*, *in* 7 COMPARATIVE ENVIRONMENTAL LAW & POLICY SERIES 1, 68–70 (Eric W. Orts & Kurt Deketelaere eds., 2004).

52. Dominic McGoldrick, *Sustainable Development and Human Rights: An Integrated Conception*, 45 INT'L & COMP. L.Q. 796, 804–05 (1996).

53. Press Release, Secretary General, Protecting Environment Is 'an Urgent Moral Imperative', Sacred Duty for All People of Faith, Secretary-General Tells Vatican Workshop on Climate Change, U.N. Press Release SG/SM/16710-ENV/DEV/1510 (Apr. 28, 2015) (U.N. Secretary General Ban Ki Moon noting that humans have a moral duty to protect the environment).

54. May, *supra* note 31, at 138.

55. *See generally* CONSTITUCIÓN POLÍTICA DE COLOMBIA [C.P.] art. 79 (outlining the right of every individual to enjoy a healthy environment); INDIA CONST. art. 51A § g (describing the Indian citizen's constitutional duty to protect the environment).

56. May, *supra* note 31, at 177.

57. *See* U.N. SECRETARY-GENERAL, REPORT OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT: OUR COMMON FUTURE, U.N. Doc. A/42/427 (1987) (proposing a global agenda for change and addressing environmental concerns.).

environmental rights.[58] Several scholars consider human rights mechanisms to be the best mechanisms for recognizing a right to a clean environment.[59] Linking human rights and environmental rights could create a mutual benefit when environmental protections would strengthen the existing human rights system.[60] Additionally, the human rights framework could refresh itself with new elements that are not currently considered.[61] Environmental rights, when granted as a rights-based approach within a human rights framework, could be elevated to the highest norm—even to a constitutional norm which cannot be denied or deprived by arbitrary means.[62] This would be beneficial because, internationally, human rights mechanisms are stronger and more influential than environmental treaties.[63]

Environmental protection and human rights have now been recognized and developed as intertwined and complementary goals.[64] Judicial decisions reflect this. For example, the decision of the International Court of Justice in Gabčikovo Nagyamaros notes: "The protection of the environment is … a vital part of contemporary human rights doctrine, for it is a *sine qua non* for numerous human rights such as right to health and right to life itself."[65] Scholars like Alan Boyle have pointed out that analyzing the right to a clean environment from a human rights perspective has three advantages: (1) the human rights perspective addresses the impacts of environmental issues on individuals rather than states'; (2) it makes states accountable for environmental governance and implementation; and (3) wider interpretation of economic and social rights to include environmental protection elements acknowledges the very existence of a right to a clean environment.[66]

Though environmental rights have been discussed from a human rights perspective under a right to clean environment, environmental rights, and a right to safe and adequate environment, these rights have focused on the anthropogenic dimension, with a healthy environment as a prerequisite for a

---

58. *Id.* at part III § 4.5 (1987).

59. *See, e.g.*, Alan Boyle, *Human Rights and the Environment: Where Next?*, 23 EUR. J. INT'L L. 613, 616 (explaining how a declaration or protocol on human rights could articulate the relationship between the environment and human rights).

60. REPORT OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT: OUR COMMON FUTURE, *supra* note 57, at annexe I.

61. Cullet, *supra* note 42, at 25.

62. *See generally Equal and Inalienable Rights,* BILL OF RIGHTS INST., https://www.docsoffreedom.org/student/readings/equal-and-inalienable-rights (last visited Feb. 5, 2020) (explaining how the constitution provides for and protects inalienable rights).

63. Cullet, *supra* note 42, at 25.

64. DONALD K. ANTON & DINAH L. SHELTON, ENVIRONMENTAL PROTECTION AND HUMAN RIGHTS 119 (2011).

65. The Gabčíkovo-Nagymaros Project, Judgement, 1997 I.C.J. 7, 91–92 (Sept. 25) (separate opinion by Weeramantry, J.).

66. Boyle, *supra* note 59, at 613, 623, 629.

healthy life.[67] Thus, the right to a clean environment, which has also been considered a customary right,[68] raises the question of the nature, content, and beneficiaries of this right.[69] This substantive content of the right to a clean environment is still difficult to define.[70] A difference of opinion exists about whether these rights are individualistic, collective, or group rights.[71]

Yet another issue that needs to be addressed is the interpretation of terminology relating to the right to a clean environment. While the term "right to a clean environment" clearly denotes that humans have a right to a clean, safe, and adequate environment, does this right include rights of the environment itself? In my opinion, and continuing the rights of nature debates, this right should be interpreted to include rights of nature as well. The right to a clean environment could not only include the rights of humans to a clean environment, but it could reflect the right to a clean environment of non-human species as well, where all flora and fauna have a right to a clean environment favorable for survival. A shift to a less anthropogenically focused understanding of a healthy environment has been argued.[72] Specifically, scholars argue that the recognition of rights of nature[73] should be upheld at par with human rights to create harmonious and eco-centric sustainable development.[74] In this climate change era that includes

67. See for instance, these sources discussing the right to a clean environment, but using different terminology: Sumudu Atapattu, *The Right to a Healthy Life or the Right to Die Polluted?: The Emergence of a Human Right to a Healthy Environment Under International Law*, 16 TUL. ENVTL. L.J. 65, 67 (2002) (discussing a "human right to a healthy environment"); David P. Bryden, *Environmental Rights in Theory and Practice*, 62 MINN. L. REV. 163, 164, 175, 219 (1978) (using the term "environmental rights" in the context of the Minnesota Environmental Rights Act); May, *supra* note 31, at 113 (using the terms "fundamental, enforceable, individual right to a clean and healthy environment"); James W. Nickel, *The Human Right to a Safe Environment: Philosophical Perspectives on Its Scope and Justification*, 18 YALE J. INTL. L. 281, 281 (1993) (referring to the "right to a safe environment" or "RSE"); Dinah Shelton, *Human Rights, Environmental Rights, and the Right to Environment*, 28 STAN. J. INT'L L. 103, 103–05 (1991) (using the terms "right to environment," "safe and healthy environment," and "environmental rights"); HAYWARD, *supra* note 31, at 9.

68. John Lee, *The Underlying Legal Theory to Support a Well-Defined Human Right to a Healthy Environment* 25 COLUM. J. ENVTL. L. 283; Jennifer M. Mohamed, *Silent Spring + 55: The Human Right to a Clean Environment*, 42 ENVIRONS: ENVTL. L. & POL'Y J. 35, 38 (2018).

69. Joshua J. Bruckeroff, *Giving Nature Constitutional Protection: A Less Anthropocentric Interpretation of Environmental Rights*, 86 TEX. L. REV. 615 (2008); *see generally* Fatma Zohra Ksentini (Special Rapporteur on the Comm'n on Human Rights) *Review of Further Dev. in Fields with Which the Sub-Commissions has Been Concerned Humans Rights and the Env't*, ¶¶ 5–7, U.N. Doc. E/CN.4/Sub.2/1994/9 (July 6, 1994) (recognizing the beneficiaries of the right).

70. *See* TURNER, *supra* note 41, at 27 (explaining differences between jurisdictions in what constitutional rights are accepted in environmental lawsuits).

71. McGoldrick, *supra* note 52, at 811.

72. Bruckerhoff, *supra* note 69, at 618.

73. *See generally* Christopher Stone, *Should Trees Have Standing?—Towards Legal Rights for Natural Objects,* 45 S. CAL. L. REV. 450, 456 (1972) (discussing rights of nature being synonymous to human rights).

74. *See* Salim v. State of Uttarakhand, 2017 PIL No. 126 of 2014 (Utt.) (India) (declaring the rivers Ganga and Yamuna as legal persons); Miglani v. State of Uttarakhand, 2017 PIL No. 140 of 2015 (Utt.)

unsustainable development patterns and increasing human rights atrocities, recognizing rights of nature is essential, in part because of the environment's impact on human life.[75]

B. Procedural Right

Discussions about the right to a clean environment would not be complete without procedural rights. The right to a clean environment as a procedural right includes rights dealing with access to information, participation in decision making, and access to justice.[76] Human rights treaties have guaranteed these rights since the adoption of the UDHR.[77] Environmental protection, which the 1972 Stockholm Conference addressed,[78] was crystallized explicitly in Rio in 1992.[79] Principle 10 of the Rio Declaration, adopted during the United Nations Conference on Environment and Development, highlights the rights to information, public participation, and access to justice as three cornerstones of procedural rights in environmental law:

> Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective

---

(India) (declaring the glaciers Gangotri and Yamunotri as legal persons); Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, s 14 (N.Z.) (declaring the Te Awa Tupua river as a legal person).

75. Mohamed, *supra* note 68, at 37–38.

76. Jonas Ebbesson, *The Notion of Public Participation in International Environmental Law*, 8 Y.B. INT'L ENVTL. L. 51, 70 (1997).

77. *See* G.A. Res. 217 (III), *supra* note 1, at 73–75 (guaranteeing the right to an effective judicial remedy for violation of fundamental rights in Article 8; entitling everyone to a fair public hearing by an independent tribunal in Article 10; and granting everyone the right to freedom of opinion and expression, which includes the right to receive and impart information in Article 19); *see also* International Covenant on Civil and Political Rights, *supra* note 2, at 173 (furthering the purposes set out in the Universal Declaration of Human Rights); African Charter on Human and Peoples' Rights, June 27, 1981, 1520 U.N.T.S. 218, pmbl. (continuing to grant rights to people internationally after the adoption of the Universal Declaration of Human Rights); EUROPEAN CONVENTION OF HUMAN RIGHTS, COUNCIL OF EUROPE (1950).

78. United Nations Conference, *Report of the United Nations Conference on the Human Environment*, ¶¶ 1–2, A/CONF.48/14/Rev.1 (June 1972).

79. U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development,* U.N. DOC. A/CONF.151/26 (Vol. I), annex I (Aug. 12, 1992) [hereinafter *Rio Declaration*].

> access to judicial and administrative proceedings, including redress and remedy, shall be provided.[80]

Though these rights could ensure credibility, effectiveness, and accountability[81] in domestic environmental decision making, there is no international treaty for these procedural rights in environmental law.[82] Nevertheless, following Rio Principle 10, several environmental treaties have incorporated provisions based on these three pillars.[83] A regional convention in Europe, the Aarhus Convention,[84] implemented these pillars into enforceable rights. With a rights-based approach, this Convention is a unique step in ensuring the right to environment both substantially and procedurally.[85]

Recognizing a right to a clean environment would not ensure a complete right unless it is enjoyed in a meaningful manner by every individual. Since the environment is always interrelated with issues of development and human rights, the right to a clean environment requires that every person is able to receive information about decisions that affect the environment, through which he could form opinions and participate in decision making.[86] In other words, every person must have an opportunity to be a part of rulemaking at the grassroots level where the impacts of these decisions, including environmental harm, are mostly felt. This right must also include the right to access justice for redress of any harm that has occurred. Thus, the right to a clean environment includes the recognition of a right to a clean and safe

---

80. *Id.*

81. ELENA PETKOVA ET AL., WORLD RESOURCES INST., CLOSING THE GAP: INFORMATION, PARTICIPATION, AND JUSTICE IN DECISION-MAKING FOR THE ENVIRONMENT, (1) 66, 92 (Bob Livernash ed., 2002).

82. May, *supra* note 31, at 123–24.

83. *See*, *e.g.*, United Nations Framework Convention on Climate Change art. 3, 6(a)–(b), May 9, 1992, 1771 U.N.T.S. 107 (incorporating these three pillars); 1992 Convention on Biological Diversity art. 6, 14, June 1, 1992, 1760 U.N.T.S. 79 (incorporating these three pillars); United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification art. 3–4, June 17, 1994, 1954 U.N.T.S. 3 [hereinafter United Nations Convention to Combat Desertification] (incorporating these three pillars); Convention on the Law of the Non-Navigational Uses of International Water Courses art. 25, May 21, 1997, 2999 U.N.T.S. 12 (incorporating these three pillars).

84. *See generally* Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Oct. 3, 2001, 2161 U.N.T.S. 37770 [hereinafter Aarhus Convention] (creating enforceable rights from these three pillars).

85. Jona Razzaque, *Human Rights to a Clean Environment: Procedural Rights*, *in* RESEARCH HANDBOOK ON INTERNATIONAL ENVIRONMENTAL LAW 284, 284, 288 (Fitzmaurice, et al. eds., 2010).

86. Aarhus Convention, *supra* note 84, at art. 1.

environment to everyone, including human and non-human species,[87] along with a right to information, public participation, and access to justice. [88]

1. Access to Information

A right to information, as a *sine qua non* of the procedural right in the environment, enables people to participate effectively in decision making. This is the first step for procedural justice.[89] Since harm that occurs after the installation of a project or activity is irreversible, this factor becomes significant in acting as a preventative measure to ensure informed decisions. [90] True and timely information is a prerequisite for good governance in a democracy.[91] In environmental governance, it ensures that people are able to understand things around them and prepare themselves to participate in an informed manner.[92] Factors necessitating increased attention towards the right to a clean environment include: increased environmental damage; involvement of state and non-state parties in activities that may cause environmental pollution and harm, which could even have reverberations in a transboundary context or cause significant loss to an ecosystem; and displacements of indigenous people for development activities like dams.[93]

Environmental information, as defined by the Aarhus Convention, includes the state of the environment, factors that affect the environment, decision-making processes, and the state of human health and safety.[94] It also includes information on the environment, human and non-human factors and activities that are likely to affect the environment, and economic analyses and assumptions used in environmental decision making. [95] The right-duty paradigm inherent in the right to a clean environment sorts this information into active and passive information.[96] Active information refers to the duty

87. *See* Armin Rosencranz & Mukta Batra, *The Supreme Court of India on Development and Environment From 2001 to 2017*, 6 ENVTL. L. & PRAC. REV. 1, 5, 20–21 (2018) (describing impacts of environmental judicial decisions on humans); Essar Oil Ltd. v. Halar Utkarsh Samiti & Ors., (2004) 2 SCC 392 (recognizing impacts of environmental judicial decisions on animals).

88. James R. May, *Constitutional Directions in Procedural Environmental Rights*, 28 J. ENVTL. L. & LITIG. 27, 30, 36 (2013).

89. *Id.* at 36.

90. ANTON & SHELTON, *supra* note 64, at 357.

91. May, *supra* note 88, at 36.

92. STEPHEN STEC AND SUSAN CASEY-LEFKOWITZ, THE AARHUS CONVENTION: AN IMPLEMENTATION GUIDE, at 1, U.N. Doc. ECE/CEP/72, U.N. Sales No. E.00.II.E.3 (2000).

93. *See generally id.* (discussing factors affected by a right to a clean environment).

94. Aarhus Convention, *supra* note 84, at art. 2 § 3.

95. *Id.*

96. Aaron Xavier Fellmeth, *Paradigms of International Human Rights Law*, 111 AM. J. INT'L L. 819, 820 (2017).

of the state to collect and disseminate information among its citizens.[97] Passive information refers to the right of each citizen request information from the state.[98] In sum, access to information in environmental matters ensures transparency that enables non-state stakeholders to exercise their right in public participation and access to justice.[99] It also increases state accountability.[100] Several countries have now protected these rights, either through their Constitution or legislation.[101]

2. Public Participation

The participatory right, which enhances the sustainability of natural resources, also allows non-state entities to participate in decision making both at the international and domestic level, which was hitherto confined to state entities only.[102] However, law making without public participation lacks effectiveness and legitimacy. Decision making requires public participation because of public participation can contribute to environmental protection via environmental legislation.[103] Additionally, through the human rights lens, public participation provides legitimacy to decision making.[104]

It is quite clear that both the law makers and citizens should be a part of law making. Taking from the definition of democracy, for the people, by the people and of the people,[105] environmental law making should have participation at the grassroots level, especially when most large-scale development projects have simultaneous impacts on the displaced population and natural environment.

A right to a clean environment could guarantee public participation, which in turn could empower people to demand information and public participation in environmental decision making. Public participation would

---

97. *See generally* Aarhus Convention, *supra* note 84, at art. 5 (requires state to disseminate information to the public).

98. *See id.* at art. 4 (describing how the government will make environmental information available to the public).

99. Peter Oliver, *Access to Information and to Justice in EU Environmental Law: the Aarhus Convention*, 36 FORDHAM INT'L L. J. 1423, 1425–26, 1433 (2013).

100. *Id.* at 1436, 1443, 1445.

101. *Constitutional Protections of the Right to Information* (Jan. 9, 2012), http://www.right2info.org/constitutional-protection (last modified Jan. 9, 2012) (finding that countries including Brazil, Argentina, Chile, Mexico, Norway, Finland, Hungary, Greece, Sweden, New Zealand, Pakistan, South Africa, Kenya explicitly provide the right to information in their Constitutions; India and the United States have enacted legislation on the right to information).

102. Ebbesson, *supra* note 76, at 54.

103. *Id*. at 68.

104. *Id.* at 62.

105. *Government of the People, by the People, and for the People*, https://www.dictionary.com/browse/government-of-the-people--by-the-people--and-for-the-people (last visited Feb. 26, 2020).

also allow for people to use access to justice mechanisms if their rights were violated. Several international agreements have recognized the significance of public participation in their provisions.[106] For instance, the Rio Declaration and Agenda 21 mandate public participation for handling environmental issues.[107] Not only does the Declaration call upon the states to ensure public participation, but it also highlights the role of women,[108] youth,[109] indigenous people, and local communities[110] in environmental management and development.[111]

The 1992 United Nations Framework Convention on Climate Change requires the state to promote and cooperate in education, training, and public awareness of climate change and to encourage public participation. This includes encouraging participation by non-governmental organizations.[112] An environmental impact assessment is considered an apt mechanism to assess the harm of developmental activities to the environment.[113] For instance, the 1992 Convention on Biological Diversity requires that states introduce such assessments along with public participation.[114] In addition, conventions, like Desertification,[115] also encourage states to allow stake holders to participate in decision making and implementation.[116]

---

106. *See generally,* United Nations Conference on Environmental & Development, Agenda 21, Sec. 1.3, A.CONF/151/26 (June 1992) ("The broadest public participation . . . should also be encouraged."); Aarhus Convention, *supra* note 84; Convention On Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, 38 I.L.M 517 (June 25, 1999) ("Recognizing that, in the field of the environment, improved access to information and public participation in decision-making enhance the quality and the implementation of decisions. . ."); *Rio Declaration*, *supra* note 79 ("Environmental issues are best handled with the participation of all concerned citizens. . . .").

107. United Nations Conference on Environment & Development, Agenda 21 (June 3–15, 1992); *Rio Declaration, supra* note 79, at princ. 10; *see* G.A. Res. 217, *supra* note 1, at art. 21 (creating a generalized right of public participation in government affairs in Article 21).

108. *Rio Declaration*, *supra* note 79, at princ. 1, 20.

109. *Id.*

110. *Id.* at princ. 22.

111. *See id.* at princ. 4, 5, 20–22 (identifying women, youth, indigenous and local populations; and outlining the roles and impacts of local authorities, industry and development, and science in sustainability).

112. United Nations Framework Convention on Climate Change art. 4(1)(i), Sept. 9, 1992, 1771 U.N.T.S 107.

113. *See* Framework Convention on Climate Change, *supra* note 83, at art. 14(1) (advocating public participation in an environmental impact assessment).

114. *See* Convention on Biological Diversity, *supra* note 83, at art. 14(1) (advocating public participation in an environmental impact assessment).

115. United Nations Convention to Combat Desertification, *supra* note 83, at art. 3.

116. *Id. at art. 4.*

Environmental harms know no political boundary, with impacts crossing state boundaries.[117] This transboundary nature of degradation is a challenge in environmental management because it requires cooperation and coordination of all states, highlighting the significance of international management of environmental issues.[118] The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo) Convention on transboundary environmental issues requires states to take legal, administrative, and other measures to initiate environmental impact assessment measures, including public participation. [119] The Espoo Convention also address the transboundary impacts of environmental decision making.[120] Similarly, the Aarhus Convention of 1998 has elaborate provisions on public participation.[121] Article 6 of the Convention makes public participation mandatory for activities listed in Convention Schedule 1 and activities which are not listed but have "significant effects on the environment."[122]

Both the Espoo and Aarhus Conventions provide models for effective public participation and environmental management, and both acknowledge that environmental issues are transboundary in nature. However, they are regional conventions, which makes their adoption and implementation difficult at the global level unless strong conservation efforts drive law makers to adopt the Conventions in other regions as well.[123] Public participation provisions could be helpful if successfully implemented at national levels. Public participation could take the form of elections, grassroots actions, lobbying, public speaking, or hearings, among others.[124] However, this public participation, in turn, requires the right to access justice to make it complete.

3. Access to Justice

The third pillar of procedural rights in environmental matters is access to justice. Access to justice is quintessential to ensure that the executive

---

117. *See generally,* Daniel Bodansky et al., *International Environmental Law: Mapping the Field*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 1, 8 (Daniel Bodansky et al. eds., 2008) ("International environmental problems are interconnected and need to be addressed holistically.").

118. *Id.*

119. Convention on Environmental Impact Assessment in a Transboundary Context, *supra* note 83, at art. 2.

120. *Id*.

121. Aarhus Convention, *supra* note 84, at art. 6–8.

122. *Id.* at art. 6.

123. Convention on Environmental Impact Assessment in a Transboundary Context, *supra* note 83, at art. 18.

123. ANTON & SHELTON, *supra* note 64, at 381.

guarantees rights to information and public participation. If access to justice is not recognized, the executive could deny access to information or public participation on grounds like public safety or national security.[125] Article 8 of the UDHR affirms that the right to an effective judicial remedy is a human right. [126] Article 2(3) of the ICCPR requires that each state ensures: (1) an effective remedy to every person whose rights or freedoms are violated; (2) that this right be determined by competent judicial, administrative, or legislative authorities; and (3) that these competent authorities shall enforce such remedies.[127]

On a national level, access to justice in environmental matters enables aggrieved persons to challenge the legitimacy of substantive and procedural irregularities involved in any state decision. Access to justice has also resulted in the creation of a right to a clean environment in many jurisdictions, like India.[128] Examples of concepts that judicial decisions have contributed to include: ecologically sustainable development; the polluters pay principle; the precautionary principle; the public trust doctrine; and the preventive principle.[129] Several treaties have also incorporated some of these laws or concepts.[130]

The Aarhus Convention includes the two pillars mentioned above and also contains elaborate provisions for access to justice.[131] It ensures that any person who has been wrongfully denied information has access to a review procedure before a court of law or another independent and impartial body established by law.[132] This Convention also provides access to an expeditious procedure that is either free of charge or inexpensive.[133] Several countries' Constitutions have provided citizens access to justice as a human right.[134]

---

125. *See* May, *supra* note 88, at 40 (listing the ways access to information can be limited).

126. G.A. Res. 217 (III), *supra* note 1, at 73.

127. International Covenant on Civil and Political Rights, *supra* note 2, at art. 2 (3).

128. Brian J. Preston, *The Judicial Development of Environmentally Sustainable Development, in* RESEARCH HANDBOOK ON FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL LAW 475, 475–76, 503 (Douglas Fisher ed., 2016) (explaining India's judicial construction of access to justice for indigent populations); *see also* PETKOVA ET AL., *supra* note 81, at 103 (noting that there are either reduced fees or no fees for environmental cases).

129. *See*, *e.g.*, Preston, *supra* note 128, at 476 (explaining that courts help to develop the concept of ecologically sustainable development); A.P. Pollution Control Board v. M.V. Nayudu, (1999) 2 SCC 718 (India) (taking the concepts of the precautionary principle and the polluter pays principle and incorporating it into Indian law); M.C. Mehta v. Kamal Nath, (1997) 1 SCC 388 (India) (incorporating the public trust doctrine into Indian law).

130. *See* BODANSKY, *supra* note 22, at 13 (discussing sources of international environmental law).

131. Aarhus Convention, *supra* note 84, at art. 9.

132. *Id.*

133. *Id.*

134. *See, e.g.*, CONSTITUCIÓN POLÍTICA DE COLOMBIA [C.P.] art. 229 (outlining the right of any individual to have access to the administration of justice); CONSTITUCIÓN POLÍTICA DE REPÚBLICA DE CHILE [C.P.] art. 19 (3) (outlining the right to equal protection under the law in the exercise of people's

Access to justice has been utilized to foreground environmental issues and seek remedy in such cases.[135] Although the right of accessing justice has applied to non-citizens, this is not the case in all situations.[136] This complexity compounds in environmental issues. For example, in many cases involving environmental refugees migrating from vulnerable countries and seeking assistance from host countries, the host country becomes caught up with security issues and denies refugees basic human rights.[137]

Similarly, non-citizens who suffer from environmental harm caused by neighboring states have difficulty holding these states responsible. These matters are adjudicated in international court.[138] However, international court decisions are often not successfully implemented by states, further complicating the issue.[139] International courts often address environmental harm as a collective issue instead of an individual harm.[140] Therefore, women and women's rights find no mention.

C. The Right to a Clean Environment: A Feminist Critique

Environmental law, developed since 1972, has addressed several issues of environmental degradation ranging from land, air, water, and the highly debated concerns of increasing impacts of climate change.[141] Legal challenges would enhance the development of laws and regulations. Yet, existing laws have not been able to reduce environmental degradation.[142] The

---

constitutional rights); POLITICAL CONSTITUTION OF PERU art. 2 (2) (outlining the right of every person to equality before the law); CONSTITUCIÓN POLÍTICA DE LA REPUBLICA DEL ECUADOR [C.P.] art. 75 (outlining the right of every person to free access to justice).

135. Brian J. Preston, *Benefits of Judicial Specialization in Environmental Law: The Land and Environment Court of New South Wales as a Case Study*, 29 PACE ENVTL. L. REV. 396, 405–06 (2012).

136. Robert B. Gordon, *Lawyers, the Legal Profession & Access to Justice in the United States: A Brief History*, 148 DAEDALUS 177, 181 (2019).

137. *See*, *e.g.*, Tim McDonnell, *The Refugees the World Barely Pays Attention to* (June 20, 2018), https://www.npr.org/sections/goatsandsoda/2018/06/20/621782275/the-refugees-that-the-world-barely-pays-attention-to (discussing environmental refugees, the tents they are forced into, and the increased terrorism within them); INTERNAL DISPLACEMENT MONITORING CTR., ON THE GRID: THE GLOBAL DISPLACEMENT LANDSCAPE 18 (2018) (showing different areas that have been displaced by environmental disasters).

138. DUNCAN BRACK, INTERNATIONAL ENVIRONMENTAL DISPUTES: INTERNATIONAL FORUMS FOR NON-COMPLIANCE AND DISPUTE SETTLEMENT IN ENVIRONMENT-RELATED CASES 4 (2001) (noting that international courts have jurisdiction over disputes between countries).

139. *See*, *e.g.*, Aloysius P. Llamzon, *Jurisdiction and Compliance in Recent Decisions of the International Court of Justice*, 18 EUR. J. INT'L L. 815, 833–35 (2008) (illustrating that international courts are limited in their power to compel compliance by Sovereign States).

140. Bodansky et al., *supra* note 117, at 2.

141. Shiraz Rustomjee, *Global Environmental Law and India*, 36 INT'L J. LEGAL INFO. 342, 342, 345–46, 349–50 (2008).

142. *See* Itzhak (Zahi) Ben-David et al., *Research: When Environmental Regulations are Tighter at Home, Companies Emit More Abroad,* HARV. BUS. REV. (Feb. 4, 2019),

right to a clean environment becomes more significant in this climate change era where environmental degradation and its drastic impacts are highly expanding and clearly visible.

Environmental treaty negotiations and implementations have experienced a North-South divide with a Northern predominance in policy making.[143] The North stresses a technocratic approach defined by scientific principles.[144] Meanwhile, the global South argues for differential treatment of countries defined by principles of social justice, self-determination and democracy, and cultural rights of nations.[145] Environmental protection priorities also vary between the North and South. The North highlights advanced environmental issues like ozone depletion.[146] The South—which includes developing nations—highlights the issues that affect the daily lives of millions, like impacts of water scarcity, desertification, food security, and environmental pollution, and stresses developing countries' necessity for economic growth to address impending poverty.[147]

The inequity in priorities and approaches between developed and developing countries originated from historic colonialization and its impacts leading to environmental injustice at the global scale.[148] The unsustainable consumption patterns of the global North combined with an increasing demand for goods result in degradation of nature in the South—the burdens of which are inappropriately imposed upon vulnerable categories like women, indigenous people, and children.[149] International environmental law, however, does not address these impacts.[150] Its focus is primarily on

---

https://hbr.org/2019/02/research-when-environmental-regulations-are-tighter-at-home-companies-emit-more-abroad (showing that pollution controls do not work at the global scale).

143. Sumudu Atapattu & Carmen G. Gonzalez, *The North-South Divide in International Law: Framing the Issues*, *in* INTERNATIONAL ENVIRONMENTAL LAW AND THE GLOBAL SOUTH 1, 2 (Shawkat Alam et al. eds., 2015) (describing the historic context of the North-South divide).

144. *Id.*

145. Carmen G. Gonzalez, *Beyond Eco-Imperialism: An Environmental Justice Critique of Free Trade*, 78 DENV. U.L. REV. 979, 985–87 (2001).

146. M. Rafiqul Islam, *History of the North-South Divide in International Law, in* INTERNATIONAL ENVIRONMENTAL LAW AND THE GLOBAL SOUTH 31 (Shawkat Alam et al., eds., 2015).

147. *See generally* Atapattu & Gonzalez, *supra* note 143, at 1 (describing the historic context of the North–South divide).

148. *See* Carmen G. Gonzales, *Genetically Modified Organisms and Justice; The International Environmental Justice Implications of Biotechnology,* 19 GEO. INT'L ENVTL. L. REV. 583, 593–95 (2007) (describing underlying causes of global injustices).

149. *Id.*; Carmen G. Gonzales, *Environmental Justice and International Law, in* ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 77, 78 (Shawkat Alam et al., eds., 2013).

150. *See* Hari M. Osofsky, *Learning from Environmental Justice: A New Model for International Environmental Rights*, 24 STAN. ENVTL. L. J. 71, 75, 77 (2005) (discussing the impacts not addressed in international environmental law).

environmental harm and preventing environmental damage rather than on the impacts of these harms on human beings.[151]

Environmental justice is grounded in human rights and fights substantive and procedural injustices based on race, color, and socio-economic status.[152] It aptly forms the basis for discussing environmental rights from a gendered dimension. [153] A human rights framework could fill the gap that environmental law could not fill. Hence, recognizing the right to a clean environment is the essential tool to address environmental impacts borne by vulnerable communities like women.

Environmental law is only as effective as who participates in making it. Under public international law, states are the primary law makers, although non-state actors, like NGOs, are also provided a venue in these discussions and negotiations.[154] Yet, the voices of the victims of environmental harm—particularly women's voices—remain unheard in these platforms.[155] Unless discussions and negotiations recognize women's voices, the right to a clean environment remains yet another right created for all but not actually helping those most impacted by the consequences of the states' decisions.

Environmental degradation severely impacts the lives of women in the global South because their lives are closely knitted around nature and the environment. [156] Several scholars adopt an eco-feminist perspective in analyzing environmental degradation and its impacts on women.[157] Taking inspiration from the eco-feminist perspective, this article follows their analyses to examine the legal framework of the right to a clean environment in India from the women's rights perspective.

Recognizing the right to a clean environment creates a duty.[158] The responsibility for the duty rests upon the state to ensure environmental

---

151. *Id.* at 107.

152. Sheila Foster, *Justice from the Ground Up: Distributive Inequities, Grassroots Resistance, and the Transformative Politics of the Environmental Justice Movement*, 86 CALIF. L. REV. 775, 776 (1998).

153. Osofsky, *supra* note 150, at 107.

154. BODANSKY, *supra* note 22, at 13; Kamrul Hossain, *The International Environmental Law-Making Process*, *in* ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 61, 62 (Shawkat Alam et al. eds., 2013).

155. *See* Bethany Caruso, *Women Still Carry Most of the World's Water* (July 16, 2017), https://theconversation.com/women-still-carry-most-of-the-worlds-water-81054 (reporting on the burden women bear from water shortages and their lack of involvement in decision-making process concerning this problem).

156. *See A Deepening Crisis,* FOOD & AGRIC. ORG. OF THE U.S., www.fao.org/3/S5500E/S5500E08.htm#P219_25283 (last visited Mar. 3, 2020) (explaining how women directly rely on natural resources).

157. For examples of writing regarding this topic, see VANDANA SHIVA, STAYING ALIVE: WOMAN, ECOLOGY AND DEVELOPMENT (1989); MARIA MIES & VANDANA SHIVA, ECOFEMINISM (1993); BINA AGARWAL, ENVIRONMENTAL CHANGE AND COLLECTIVE ACTION (2016).

158. INDIA CONST. art. 51A§ g.

protection.[159] Hitherto, this right remains a general human right for every human being. However, taking into consideration women and their special needs, it is high time to rewrite and reconceptualize this right through an eco-feminist perspective.

Eco-feminism[160] addresses the domination of women, children, people of color, and underprivileged people and the non-human environment.[161] It correlates the subordination of women and nature by power circles.[162] Eco-feminism is related to the broader environmental justice movement, which arose from the discriminatory environmental harm suffered by people of color in U.S. and then perpetuated as a global movement against environmental imperialism.[163] Both movements focus on the shifting attitude towards the affected persons, recognizing them as rights holders rather than only victims.

Surprisingly, the trajectory of the development of the eco-feminist movement parallels the growth of environmental law. Eco-feminism developed in 1970s, with its contextual, pluralistic, inclusive, and holistic nature being drawn from elements of feminism, environmentalism, and philosophy.[164] The eco-feminist approach applies the feminist idea of gender as the starting point to analyze the concept of "domination."[165] Eco-feminism examines how societal powers dominate women and nature, and it analyzes the philosophical underpinnings of these domination theories and structures.[166] According to the Water Supply and Sanitation Collaborative Council, gender "refers to the socially determined roles and responsibilities of women, men and children. Gender is related to how we are perceived and

159. *See generally* United Nations Human Rights Special Procedures, *Framework Principles on Human Rights and the Environment*, U.N. Doc. a/HCR/37/59 (Jan. 24, 2018) (noting that states have a responsibility to protect the environment).

160. Francoise d'Eaubonne coined the term "Eco-feminism" in her 1974 book, *Feminism or Death*. *See* Mark Somma & Sue Tolleson-Rinehart, *Tracking the Elusive Green Women: Sex, Environmentalism, and Feminism in the United States and Europe*, 50 POL. RES. Q. 153, 153 (1997) (discussing the origin of the term "eco-feminism").

161. Karen J. Warren, *Introduction* to ECOFEMINISM: WOMEN, CULTURE, NATURE xi (Karen J. Warren & Nisvan Erkal eds., 1997) (explaining the concept of ecofeminism).

162. *See* Abeda Sultana, *Patriarchy & Women's Subordination: A Theoretical Analysis*, THE ARTS FAC. J., July 2010–June 2011, at 1, 6–11 (explaining the concept of female subordination and dependence).

163. Vast literature is available on the environmental justice movement: Alice Kaswan, *Environmental Justice: Bridging the Gap Between Environmental Laws and "Justice"*, 47 AM. U. L. REV. 221, 256 (1997); Eileen Guana, *The Environmental Justice Misfit: Public Participation and the Paradigm Paradox*, 17 STAN. ENVTL. L.J. 3, 5, 8 (1998); Robert D. Bullard, *Race and Environmental Justice in the United States*, 18 YALE J. INT'L L. 319, 319–20 (1993).

164. JYTTE NHANENGE, ECOFEMINISM: TOWARDS INTEGRATING THE CONCERNS OF WOMEN, POOR PEOPLE, AND NATURE INTO DEVELOPMENT 98 (2011).

165. Warren, *supra* note 161, at xi.

166. *Id.* at 98–99.

expected to think and act as women, men or children (girls and boys) because of the way society is organized, and not because of our biological differences."[167]

Gender is not the only significant element in eco-feminism. Eco-feminism also links women and nature through the lens of the suppression of these two entities.[168] According to the eco-feminist ideology, the same structural and ideological factors that determine the subordination of women in a society equally apply to conquering natural resources.[169] Bina Agarwal notes that eco-feminism highlights conceptual links between depicting women and nature and the ways of acting upon them, commonalities of women and nature movements, and the alternative vision for an egalitarian society.[170] Thus, bringing gender and the environment together would highlight the need to rethink and reexamine concepts and methods of development, redistribution, and institutional changes.[171]

Eco-feminism could prove to be a useful tool for rethinking the content of the right to a clean environment in different ways. Women are depicted as victims of environmental damage and, at the same time, considered to be the engineers of environmental protection.[172] Firstly, the eco-feminist view could foreground the issues of women as victims and argue for their rights to be treated equally. Secondly, following and expanding upon this, the eco-feminist view could argue for equal participation in law making in both international and domestic environmental matters. Women could project themselves as equal rights holders and make their voices heard to enact laws that consider their needs as well. Thirdly, the eco-feminist view could define the right to a clean environment with the principles of equality, sustainability, and intergenerational equity with a focus on resource protection.

Currently, international environmental law adopts a duty-oriented approach focused on preventing environmental harm and imposing sanctions upon violators.[173] Environmental law negotiators have also investigated the debates between the global North and South in the context, content, scope,

---

167. WATER SUPPLY & SANITATION COLLABORATIVE COUNCIL, VISION 21: A SHARED VISION FOR HYGIENE, SANITATION AND WATER SUPPLY AND A FRAMEWORK FOR ACTION 8 (2000).

168. NHANENGE, *supra* note 164, at 99.

169. *See* CHRIS J. CUOMO, FEMINISM AND ECOLOGICAL COMMUNITIES 1 (1998) (explaining that an essential part of feminist environmentalism is acknowledging the connections and similarities between human oppression and the degradation of nature).

170. AGARWAL, *supra* note 157, at 24.

171. *Id.* at 56.

172. Warren, *supra* note 161, at 5–11.

173. BOYD, *supra* note 34, at 52; *see generally* Robert I. McMurry & Stephen D. Ramsey, *Environmental Crime: The Use of Criminal Sanctions in Enforcing Environmental Laws*, 19 LOY. L.A. L. REV. 1133 (1986) (discussing the use of duty, responsible corporate officer, and similar doctrines to sanction entities for violating environmental regulations).

and mechanisms of regulations. These investigations focus on burden-sharing in financial and technical assistance for the prevention and mitigation of environmental harms.[174] These state-centered discussions give due attention to the differential treatment of developing states where individuals, particularly women, have been suppressed during these debates—their pains and concerns left in a vacuum.[175] Hence, recognizing a right to a clean environment from a gender dimension is essential. The major prerequisite to achieving this recognition is deviating from state-centered discussions to a rights-holder-centered approach that includes due consideration for the previously ignored classes: women and nature.

III. RIGHT TO A CLEAN ENVIRONMENT IN INDIA: RECOGNITION AND DEVELOPMENT

A. Constitutional Rationale and Parameters

The right to a clean and safe environment is a fundamental right under Article 21 of the Indian Constitution.[176] The Constitution does not explicitly include the environment *as either a right of the citizens or as a duty of the state*. Instead, this right is derived from the right to life enshrined in Article 21, which interprets the right to a clean and safe environment as either a pre-condition or an essential component of life.[177] The Stockholm Declaration of 1972 significantly impacted Indian domestic law by encouraging the Indian government to exercise its international obligations to implement the principles of the Declaration.[178] The Indian government exercised these rights by enacting a Constitutional Amendment Bill, with separate statutes

174. *See, e.g.*, Bharat H. Desai & Balraj K. Sidhu, *Quest for International Environmental Institutions: Transition from CSD to HLPF*, *in* INTERNATIONAL AND ENVIRONMENTAL LAW AND THE GLOBAL SOUTH 152, 164–65 (Shawkat Alam et al. eds., 2015) (explaining that financial burdens of having representation in these meetings to mitigate environmental damage can be too much for the Global South and that the Global North would need to help financially); Karin Mickelson, *The Stockholm Conference and the Creation of the North-South Divide in International Environmental Law and Policy*, *in* INTERNATIONAL ENVIRONMENTAL LAW AND THE GLOBAL SOUTH 109, 164–65 (Shawkat Alam et al. eds., 2015) (examining landmark events and debates regarding global environmental problems and their solutions); John Ntambirweki, *The Developing Countries in the Evolution of an International Environmental Law,* 14 HASTINGS INT'L & COMP. L. REV. 905, 911–17 (1991) (discussing the implementation of financial and technical assistance in international treaties).

175. Ntambirweki, *supra* note 174, at 907, 910; Intell. F. v. State of A.P., (2006) 3 SCC 549.

176. Virendra Gaur v. State of Haryana, (1994) 6 SCR 78 (India).

177. INDIA CONST. art. 21 ("No person shall be deprived of his life or personal liberty except according to procedure established by law.").

178. *See Stockholm Declaration*, *supra* note 18, ¶ 8 (encouraging nations to take responsibility and act to preserve the human environment).

on water and wildlife.[179] Article 48-A resulted from these efforts.[180] An addition to Part IV of the Directive Principles of State Policy (DPSP), Article 48A provides that "[t]he State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country."[181]

The 1972 Stockholm Declaration called for nations to act upon their duties and reminded mankind to protect the environment, rather than recognizing the human right to a clean and safe environment or the environment's own rights. A rights-based approach to the environment was missing in those principles. The government of India included protections for environment in Article 48A and in DPSP Part IV-A to remind the State and her citizens of their duty to protect the environment.

The DPSP's non-justiciable but welfare-oriented principles are crucial in administration and law making.[182] The principles outlined in the DPSP guide the Indian government in its efforts to establish a welfare state based on the principles of equality, liberty, and fraternity as envisaged by the Preamble of the Indian Constitution.[183] These principles also encourage the development of an egalitarian system through affirmative actions to reduce socio-economic disparities.[184] The DPSP has helped form a society that recognizes the constitutional goals of social, economic, and political justice.[185]

The DPSP's significance in the realm of governance and law making has transformed its interpretation. Formerly non-justiciable and inferior to fundamental rights,[186] the DPSP is now an essential part of constitutionally recognized fundamental rights.[187] Establishing the DPSP as an important part

---

179. The Water (Prevention & Control of Pollution) Act, No. 6 of 1974, INDIA CODE (2019); The Wildlife (Protection) Act, No. 53 of 1972, INDIA CODE (2019).

180. INDIA CONST. art. 48A.

181. *Id.*

182. *See id.* at art. 37 ("The provisions contained in this Part shall not be enforceable by any court, but the principles therein laid down are nevertheless fundamental in the governance of the country and it shall be the duty of the State to apply these principles in making laws.").

183. *Id.* ("The provisions contained in this Part shall not be enforceable by any court, but the principles therein laid down are nevertheless fundamental in the governance of the country and it shall be the duty of the State to apply these principles in making laws.").

184. For discussions on DPSP, its aims and objectives, see generally, ARUN K THIRUVENGEDAM, THE CONSTITUTION OF INDIA: A CONTEXTUAL ANALYSIS (2017); H. M. SEERVAI, 2 CONSTITUTIONAL LAW OF INDIA: A CRITICAL COMMENTARY (1993); M. P. JAIN, INDIAN CONSTITUTIONAL LAW 742–48 (1987); B SHIVA RAO, THE FRAMING OF INDIA'S CONSTITUTION; SELECT DOCUMENTS (1966); GRANVILLE AUSTIN, THE INDIAN CONSTITUTION: CORNERSTONE OF A NATION 75–83 (1966); DURGA DAS BASU, COMMENTARY ON THE CONSTITUTION OF INDIA 287–90 (5th ed. 1965).

185. *See generally* GRANVILLE AUSTIN, *supra* note 184 (describing the aims and objectives of the DPSP).

186. State of Madras v. Srimathi Champakam Dorairajan, AIR 1951 SC 226 (India); Mohd. Hanif v. State of Bihar, AIR 1958 SC 731 (India).

187. CJ Das, who previously gave judgment on Champakam Dorairajan, AIR 1951 SC 226, held that : "Nevertheless, in determining the scope and ambit of the fundamental rights relied on by or on behalf

of the Indian legal and governmental systems—and equating its status with fundamental rights—creates a duty for the state to protect individual rights.[188] The Indian Supreme Court applied Article 48A in several cases relating to environmental issues.[189]

In addition to modifying Part IV of the Constitution, the 42nd Amendment added the environment to Part IV-A-Fundamental Duties.[190] Article 51A(g) of Part IV-A created a fundamental duty for every citizen "to protect and improve natural environmental including forests, lakes, rivers, and wildlife, and to have compassion for living creatures."[191] Though these environmental aspects were added to the Constitution by the 42nd Amendment, other provisions in the Constitution could also be applied to the environment and its components.[192] For example, Constitutional provisions that require the state to address public health issues[193] and to organize agriculture and animal husbandry[194] also reflect the government's interactions with the environment, though indirectly.

A discussion of Constitutional provisions relating to the environment would not be complete without addressing the division of legislative powers between the central government and the states.[195] The constitutional division

---

of any person or body the court may not entirely ignore these directive principles of State policy laid down in Part IV of the Constitution but should adopt the principle of harmonious construction and should attempt to give effect to both as much as possible." *In re* The Kerala Education Bill 1957 v. Unknown, (1959) 1 SCR 995, ¶ ¶ 12, 14 (1958) (India); *see also* State of Madras v. Srimathi Champakam Dorairajan, AIR 1951 SC 226 (clarifying the interpretation of the Constitution); Minerva Mills Ltd. v. Union of India, AIR 1980 SC 1789 (India) (clarifying the interpretation of the Constitution).

188. C.M. Abraham, *Environmental Jurisprudence in India*, *in* 2 THE LONDON-LEIDEN SERIES ON LAW, ADMINISTRATION AND DEVELOPMENT 1, 18–19 (1999).

189. *See*, *e.g.*, Virendra Gaur v. State of Haryana, (1994) 6 SCR 78 (India) ("Environmental ecological, air, water, pollution, etc. should be regarded as amounting to violation of Article 21."); Indian Council for Enviro-Legal Action v. Union of India, AIR 1996 SC 1446 (citing Article 48A as the statutory authority that mandates the Indian government to protect its citizens living near chemical industrial plants from environmental harms); M.C. Mehta v. Union of India, AIR 1998 SC 1037 (recognizing the individual rights of workers and their rights to better working conditions and compensation for damages); Rural Litigation and Entitlement Kendra Dehradun v. State of Uttar Pradesh, AIR 1988 SC 594 (India) (citing Article 48A as the government's obligation to stop illegal mining and preserve forested areas); Kinkri Devi And Anr. v. State of Himachal Pradesh, AIR 1988 HP 4 (India) (asserting Article 48A in best practices in mining operations to minimize damage to the environment).

190. INDIA CONST. art. 51A § g.

191. *Id.*

192. *Id.*

193. *Id.* at art. 47 ("The State shall regard the raising of nutrition and the standard of living of its people and the improvement of public health as among its primary duties and, in particular, the State shall endeavor to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health.").

194. *Id.* at art. 48 ("The State shall endeavor to organize agriculture and animal husbandry on modern and scientific lines and shall, in particular, take steps for preserving and improving the breeds, and prohibiting the slaughter, of cows and calves and other milch and draught cattle.").

195. *See id.* at art. 245–50 (outlining the distribution of legislative powers in the Indian government).

of legislative powers is enumerated in three lists: the Union List, the State List, and the Concurrent Lists.[196] In accordance with Article 246, the Union List vests legislative power of entries in the Union Government; the State List vests legislative power of entries in the states; and the Concurrent List vests shared legislative power between the central and state governments, subject to Article 254.[197] Similarly, Parliament has the exclusive power over any residual matter not provided for in the lists.[198]

196.

> (1) Notwithstanding anything in clauses (2) and (3), Parliament has the exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the 'Union List').
> (2) Notwithstanding anything in clause (3), Parliament, and, subject to clause (1), the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (in this Constitution referred to as the "Concurrent List").
> (3) Subject to clauses (1) and (2), the Legislature of any State has exclusive power to make laws for such State or any part thereof with respect to any of the matters enumerated in List II in the Seventh Schedule (in this Constitution referred to as the "State List"). (4) Parliament has power to make laws with respect to any matter for any part of the territory of India not included 2 [in a State] notwithstanding that such matter is a matter enumerated in the State List.

Id. at art. 246 §§ 1–3. Schedule Seven of the Constitution divides the legislative power between the central government and States in three Lists; the Union List (97 entries); the State List (66 entries); and the Concurrent List (47 items). *Id.* at sched. 7.

197.

> (1) If any provision of a law made by the Legislature of a State is repugnant to any provision of a law made by Parliament which Parliament is competent to enact, or to any provision of an existing law with respect to one of the matters enumerated in the Concurrent List, then, subject to the provisions of clause (2), the law made by Parliament, whether passed before or after the law made by the Legislature of such State, or, as the case may be, the existing law, shall prevail and the law made by the Legislature of the State shall, to the extent of the repugnancy, be void.
> (2) Where a law made by the Legislature of a State 1 with respect to one of the matters enumerated in the Concurrent List contains any provision repugnant to the provisions of an earlier law made by Parliament or an existing law with respect to that matter, then, the law so made by the Legislature of such State shall, if it has been reserved for the consideration of the President and has received his assent, prevail in that State: Provided that nothing in this clause shall prevent Parliament from enacting at any time any law with respect to the same matter including a law adding to, amending, varying or repealing the law so made by the Legislature of the State.

Id. at art. 254 §§ 1–2.

198.

> (1) Parliament has exclusive power to make any law with respect to any matter not enumerated in the Concurrent List or State List.
> (2) Such power shall include the power of making any law imposing a tax not mentioned in either of those Lists.

Parliamentary powers to legislate on certain subjects in the State List have been crucial for enacting environmental legislation like the 1972 Water Act.[199] According to Article 249, Parliament can make laws on any subject on the State List if the Rajya Sabha, or Council of States, passes a resolution that it is necessary and expedient to the national interest to enact such laws.[200] Parliament exercised this Article 252 power when it enacted the 1972 Water Act. Parliament did so upon request from two or more states, and a resolution that, in effect, has been passed by all Houses of Legislatures of those states.[201] The following section discusses the environmental laws Parliament has enacted.

Id. at art. 248 §§ 1–2.

199. *Id.*; The Water (Prevention & Control of Pollution) Act, No. 6 of 1974, INDIA CODE (2019).

200.

> (1) Notwithstanding anything in the foregoing provisions of this Chapter, if the Council of States has declared by resolution supported by not less than two thirds of the members present and voting that it is necessary or expedient in the national interest that Parliament should make laws with respect to any matter enumerated in the State List specified in the resolution, it shall be lawful for Parliament to make laws for the whole or any part of the territory of India with respect to that matter while the resolution remains in force.
> (2) A resolution passed under clause (1) shall remain in force for such period not exceeding one year as may be specified therein: Provided that, if and so often as a resolution approving the continuance in force of any such resolution is passed in the manner provided in clause (1), such resolution shall continue in force for a further period of one year from the date on which under this clause it would otherwise have ceased to be in force.
> (3) A law made by Parliament which Parliament would not but for the passing of a resolution under clause (1) have been competent to make shall, to the extent of the incompetency, cease to have effect on the expiration of a period of six months after the resolution has ceased to be in force, except as respects things done or omitted to be done before the expiration of the said period.

INDIA CONST. art. 249 §§ 1–3.

201.

> (1) (1)If it appears to the Legislatures of two or more States to be desirable that any of the matters with respect to which Parliament has no power to make laws for the States except as provided in articles 249 and 250 should be regulated in such States by Parliament by law, and if resolutions to that effect are passed by all the Houses of the Legislatures of those States, it shall be lawful for Parliament to pass an Act for regulating that matter accordingly, and any Act so passed shall apply to such States and to any other State by which it is adopted afterwards by resolution passed in that behalf by the House or, where there are two Houses, by each of the Houses of the Legislature of that State.
> (2) Any Act so passed by Parliament may be amended or repealed by an Act of Parliament passed or adopted in like manner but shall not, as respects any State to which it applies, be amended or repealed by an Act of the Legislature of that State.

Id. at art. 252 §§ 1–2.

B. Legislative Enactments

Despite the 42nd Amendment, which provides for the inclusion of environmental protection as a governmental initiative, the Seventh Schedule of the Constitution does not reference the environment.[202] While "water" was already an entry on the State List, the 42nd Amendment Act added "forest" to the Concurrent List.[203]

A plethora of environmental protection laws exist in India.[204] Environmental statutes are mainly used to implement DPSP rules, while courts have adopted purposive interpretations of the statutes to promote legislative objectives and intent.[205] The Bhopal Gas Tragedy of 1984 was a turning point in the environmental history of the country.[206] The tragedy led to the enactment of an umbrella legislation for environmental protection. The Environmental Protection Act 1986, however, adopts duty-based, state-focused approach without a rights framework for citizens.[207]

C. Right to a Healthy Environment: Stepping from Proactive Judiciary

The judiciary in India is the cornerstone of development of environmental jurisprudence in the country. Exercising a proactive role in interpreting constitutional provisions—especially Part III and Part IV—the Supreme Court and several High Courts have upheld the right to a clean environment as a fundamental right of every person.[208] In several other cases, the courts mandated that the State exercise its duty to protect and preserve the environment, and to protect the public health.[209] This section examines the role of the judiciary in India with regard to environmental protection and

---

202. *See id*. at art. 246 §§ 1–4, sched. 7, list I (pointing out that the Seventh Schedule lists lack any reference to the environment).

203. *See id*. art. 246, sched. 7, list II, § 17 (describing state control over waterways); *id*. art. 246, sched. 7, list III, § 17A (including an amendment adding constitutional protection of forests).

204. The Tiwari Committee, appointed by the Government of India, reported that there were almost 200 environmental related statutes in the country when the report was submitted in 1980. *See* GOV'T OF INDIA, REPORT OF THE COMMITTEE FOR RECOMMENDING LEGISLATIVE MEASURES AND ADMINISTRATIVE MACHINERY FOR ENSURING ENVIRONMENTAL PROTECTION 89, 92 (1980) (discussing the existing administrative and legal arrangements for protecting the environment).

205. SHYAM DIVAN & AEMIN ROZENCRANZ, ENVIRONMENTAL LAW AND POLICY IN INDIA 59 (2d ed. 2001).

206. Stuart Diamond, *The Bhopal Disaster: How It Happened*, N.Y. TIMES, Jan. 28, 1985, at A2.

207. The Environment (Protection) Act, NO. 29 of 1986, INDIA CODE (1986).

208. Kyle Burns, *Constitutions & the Environment: Comparative Approaches to Environmental Protection and the Struggle to Translate Rights into Enforcement*, VT. J. ENVTL. L., http://vjel.vermontlaw.edu/constitutions-environment-comparative-approaches-environmental-protection-struggle-translate-rights-enforcement/ (last visited Feb. 4, 2020).

209. *Id.*

the judiciary's contribution to the evolution of the substantive and procedural right to a clean and safe environment.

1. Expanding the Interpretation of Part III: Refining Fundamental Rights

Environmental pollution has been rampant in India for many decades.[210] Historically, citizens had limited options for bringing claims against the polluting entities.[211] Citizens could bring tort actions; writ petitions under Article 32 or Article 226 of the Constitution; file an application for compensation in the case of hazardous activities under the Public Liability Act 1991; or approach the National Green Tribunal.[212] The scope of this paper does not include judicial remedies for environmental pollution. Instead, it explores constitutionally vested authorities in the Supreme and High Courts of India, under Articles 32 and 226 respectfully, to issue certain legal instruments, like writ petitions. These petitions have given rise to several environment-related cases and have led to the subsequent recognition and development of environmental rights and jurisprudence.[213] These constitutional provisions empower the Supreme Court and High Courts to issue directions, orders, or writs—including writs of habeas corpus, mandamus, prohibition, quo warranto, and certiorari.[214]

Courts have been dynamic in the interpretation of the Indian Constitution, particularly Parts III and IV. Cases involving Part III have benefitted the most from wider interpretations.[215] From the meaning of "state" under Article 12, to the elaborate definition of "right to life" under Article 21, the courts have consistently graced each provision in Part III with similar dynnamism.[216] An extensive discussion of each article and their broad interpretation by the courts is beyond the scope of this article. Instead, the key provisions of Article 21, and related Articles, are discussed below.

Article 21 of the Constitution is the foundation for development of human rights and environmental jurisprudence in India. Through various judgments, the Supreme Court has expanded the meaning of life from mere

---

210. *Air Pollution on the Move in India,* https://www.earthobservatory.nasa.gov/images/92347/air-pollution-on-the-move-in-india (last visited Feb. 7, 2020).

211. DIVAN & ROZENCRANZ, *supra* note 205, at 49.

212. *Id.* at 87.

213. *Id.* at 50.

214. INDIA CONST. art. 32, § 2; *id.* art. 226, § 1.

215. Maneka Gandhi v. Union of India, (1978) 2 SCR 621 (establishing that the procedure established by law should not be arbitrary, unjust, or unfair).

216. INDIA CONST. arts. 12, 21; *see* Gandhi v. Union of India, (1978) SCR 621 ("Article 12 defines the State as including the Government and Parliament of India and the Government and Legislature of the States and of local or other authorities within the territory of India or under control of the Government of India.") (Kailasam, J., dissenting).

existence to meaningful living.[217] Article 21 guarantees the right to life. As interpreted in *Maneka Gandhi*, this fundamental right is not confined to executive action, but also applies to the law-making process.[218] The courts reminded the Legislature that any general procedure established by law is not sufficient to deprive a person of their life or personal liberty.[219] Instead, procedures established by law must be "fair, just and reasonable," meeting the conditions of Articles 14 and 19.[220]

This step in expanding the interpretation of the right to life tremendously changed the meaning of "life and liberty" enshrined in Article 21. A number of cases have further broadened the scope and ambit of the right to life. An observation by Justice Bhagwati highlights the judicial developments:

> The right to life enshrined in Article 21 cannot be restricted to mere animal existence. It means something much more than just physical survival . . . .The right to life includes the right to live with human dignity and all that goes along with it, namely, the bare necessaries of life such as adequate nutrition, clothing and shelter and facilities for reading, writing and expressing one-self in diverse forms, freely moving about and mixing and commingling with fellow human beings.[221]

The Supreme Court has undertaken two key steps to expand the interpretation of the right to life. First, it mandated that the procedure established by law employed for the deprivation of life and liberty should be reasonable, fair and just—which should also pass the tests under Articles 14 and 19.[222] Second, the Supreme Court derived several interrelated rights and liberties from the right to life in Article 21 and incorporated them into new ideas. One such idea was the right to a clean and safe environment examined in this article.[223]

A clean environment is quintessential for enjoying life, as noted in *Virendra Gaur v. State of Haryana*:

---

217. *Supreme Court Grants 'Right to Die With Dignity' to Terminally Ill* (Mar. 9, 2018), https://www.indiawest.com/news/india/supreme-court-grants-right-to-die-with-dignity-to-terminally/article_d4cb67ea-23e6-11e8-96ac-5b8fc4c22a39.html; *see also* Common Cause v. Union of India, (2005) 215 SCR 143 (expanding the meaning of life).

218. Maneka Gandhi v. Union of India, (1978) 2 SCR 621.

219. *Id.*

220. *Id.*

221. Francis Coralie Mullin v. Union Territory of Delhi, (1981) 2 SCR 516 (India).

222. Maneka Gandhi v. Union of India, (1978) 2 SCR 621.

223. DIVAN & ROZENCRANZ, *supra* note 205, at 49.

> Enjoyment of life and its attainment including their right to life with human dignity encompasses within its ambit, the protection and preservation of environment, ecological balance free from pollution of air and water, sanitation without which life cannot be enjoyed. Any contra acts or actions would cause environmental pollution. Environmental ecological, air, water, pollution, etc. should be regarded as amounting to violation of Article 21. Therefore, hygienic environment is an integral facet of right to healthy life and it would be impossible to live with human dignity without a humane and healthy environment.[224]

Additionally, specific components of the environment, like water and air, have been regarded as essential to enjoy one's right to life under Article 21.[225] Since the recognition of the right to a clean environment, the courts have consistently reiterated this right as a reminder to the State of its constitutional duty towards its citizens to protect the environment.[226] The Indian courts have applied international environmental legal principles like the precautionary principle,[227] the public trust doctrine,[228] the polluters pay principle,[229] and the intergenerational equity principle[230] for domestic regulation of activities that cause environmental degradation.[231]

The specialized environmental court, The National Green Tribunal (Tribunal),[232] also continues to emphasize a clean and safe environment as a part of the right to life. As the Tribunal explained in *M/s Sterlite Industries Ltd. v. Tamil Nadu Pollution Control Board*,

---

224. Virenda Gaur v. State of Haryana, (1994) 6 SCR 78 (India).

225. *See* Subhash Kumar v. State of Bihar, (1991) 1 SCR 5 (India) ("Right to live is a fundamental right under Art. 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life.").

226. Court On Its Own Motion v. Union of India, Suo Moto Writ Petition, No. 284 of 2012, ¶ 21; Delhi Jal Board v. Nat'l Campaign for Dignity and Rts., Civil Appeal, No. 5322 of 2011, ¶¶ 13–14 (India); In re Noise Pollution v. Unknown, AIR 2005 SC 3136, ¶¶ 9–10 (India); Narmada Bachao Andolan v. Union of India, (2000) 10 SCC 664, ¶¶ 1–4; Vellore Citizens' Welfare Forum v. Union of India, 1996 AIR SC 2715, ¶ 47.

227. Andhra Pradesh Pollution Control Board v. Prof. M.V. Nayudu, (1999) 2 SCC 718 (India).

228. M.C. Mehta v. Kamal Nath, (1996) 1 SCC 388 (India).

229. Vellore Citizens' Welfare Forum v. Union of India, AIR 1996 SC 2715, ¶ 47; Research Foundation for Science v. Union of India, (2005) 13 SCC 186, ¶¶ 24, 27–28; Indian Council for Enviro-Legal Action v. Union of India, AIR 1996 SC 1446.

230. Intellectuals Forum, Tirupathi v. State of Andhra Pradesh, AIR 2006 SC 1350 (India).

231. *Id.*

232. The National Green Tribunal Act established the National Green Tribunal in 2010. The objective of NGT is "effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto." The National Green Tribunal Act, NO. 19 of 2010, INDIA CODE (2010), vol. 25.

> [the] [r]ight to decent environment, as envisaged under Article 21 of the Constitution of India also gives, by necessary implication, the right against environmental degradation. It is in the form of right to protect the environment, as by protecting environment alone can we provide a decent and clean environment to the citizenry.[233]

Realizing the risk of development activities on environmental degradation, the Tribunal stressed tilting the balance in favor of the environment with the duty and obligation of protection bestowed upon the state.[234]

The right to a clean and safe environment has indeed been recognized as a fundamental right in India.[235] This right is recognized either as a part of life or a right essential to enjoy the broader right to life. The right to a clean and safe environment has not yet been recognized as an independent right beyond the right to life.

However, this interpretation reflects an anthropocentric view of the environment, where recognition of environmental rights is considered a human right essential for human life. It lacks a nature-oriented focus, though concepts of sustainable development and intergenerational equity have been widely recognized as part of this human right to a clean and safe environment.[236] In spite of recognition of this right by the courts, the right to a clean and safe environment has not been established by any statute. Though the Constitution requires the State and its citizens to protect the environment, it does so without including any right-based approach.[237] This duty-based approach signifies that these duty holders only have duties towards the environment, but the environment itself does not enjoy any related right. The gap here has been partially filled by the courts through carving out the right to a clean environment from Article 21.[238] Therefore, a combined reading of Parts III, IV, and IV-A could lead to the conclusion that the right to a clean and safe environment is an essential element of life that attaches a duty to the State and citizens to protect the environment.

It is not clear how these rights and duties are to be implemented. There are environmental statutes that use a state-oriented-duty framework instead

---

233. M/s Sterlite Indus. Ltd. v. Tamil Nadu Pollution Control Bd., Appeal No. 57/203 (2013) NGT (India).

234. Sher Singh v. State of Himachal Pradesh, O.A. No. 237 (THC)/2013 (2010) NGT Judgement Feb. 6, 2014 (India).

235. Narmada Bachao Andolan v. Union of India, (2005) 4 SCC 32.

236. Intellectuals Forum v. State of Andhra Pradesh (2006) 3 SCC 549 (India).

237. INDIA CONST. art. 51A, § g.

238. *See generally* Delhi Jal Board v. Nat'l Campaign for Dignity and Rts., Civil Appeal, No. 5322 of 2011, 11, ¶ 19 (India) (explaining the use of public interest litigation for indigent populations).

of a rights-based framework.[239] Similarly, since the environment is not confined to any one territory, there is a need for more elaborate discourse on transboundary environmental harms. Environmental rights are also essential when considering increased development activities potentially causing transboundary harms and victims of this harm transcends political boundaries

2. Relaxing Locus Standi: Public Interest Litigation

Public interest litigation (PIL) has expanded public access to the judiciary for redressing societal grievances. The law of standing in litigation has seen drastic changes since the 1980s.[240] The traditional locus standi rules maintained that bringing a claim before the judiciary was available only for a victim of an injury caused by another party's violation of some legal rule.[241] PIL has relaxed this rule of locus standi. It has expanded the ambit of judicial remedy through its distributive access to justice mechanism for the disadvantaged sections of the society.[242] Under a PIL system, any publicly minded person could act on behalf of the public or those who are unable to access traditional judicial remedies.[243] Since PIL's introduction, it has been applied in several cases concerning the right to life including prisoners' rights;[244] bonder labor;[245] the right to a speedy trial;[246] protection of women in protective housing;[247] the rights of construction workers;[248] and the right to clean and safe drinking water.[249]

The court has visualized PIL to be a collaborative effort by stakeholders, the petitioner, the state, and the judiciary all working to broaden the justice-delivery mechanism and ensure the observance of constitutional values and

---

239. *See* ORG. FOR ECON. CO-OPERATION & DEV., ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT IN INDIA: RAPID ASSESSMENT 8 (2006) (summarizing the National Environmental Policy Act of 2006, which has a state-oriented duty framework).

240. *E.g.*, Manoj Mate, *The Rise of Judicial Governance in the Supreme Court of India*, 33 B. U. INT'L L. J. 169, 171–72, 175–76, 178–79 (2015) (discussing the changes in the law of standing in litigation since the 1980s).

241. Jamie Cassels, *Judicial Activism and Public Interest Litigation in India: Attempting the Impossible?*, 37 AM. J. COMP. L. 495, 499 (1989).

242. *Id.* at 497–500.

243. S.P. Gupta v. President of India, (1982) 2 SCR 365 (1981) (India) (explaining PIL to include those who are impoverished, physically unable to access the courts, or have other socio-economic disadvantages that make traditional access to the judiciary difficult to achieve).

244. *See* Batra v. Delhi Admin., (1980) 2 SCR 557 (1979) (India) (affirming that even a prisoner is entitled to the precious rights guaranteed by Article 21 of the Constitution).

245. Bandhua Mukti Morcha v. Union of India, (1984) 2 SCR 67.

246. Hussainara Khatoon v. Home Secretary, State of Bihar, (1979) 3 SCR 169 (India).

247. Dr. Upednra Baxi v. State of Uttar Pradesh, (1983) 2 SCC 308 ¶ ¶ 1–2 (India).

248. People's Union for Democratic Rights v. Union of India, (1983) 1 SCR 456, 466.

249. Kumar v. State of Bihar, (1991) 1 SCR 5 (India); M.C. Mehta v. Kamal Nath, (1997) 1 SCC 388 (India) (citing the polluter pay principle in relation to the public trust doctrines in public interest litigation that seeks to redress the pollution of waterways and holding violators accountable).

objectives, [250] participatory justice, [251] and human rights to deprived classes.[252] As Justice Dalveer Bhanderi reminds,

> [PIL] is not in the nature of adversary litigation, but it is a challenge and an opportunity to the government and its officers to make basic human rights meaningful to the deprived and vulnerable sections of the community and to assure them social and economic justice which is the signature tune of our Constitution. The Government and its officers must welcome [PIL] because it would provide them an occasion to examine whether the poor and the down-trodden are getting their social and economic entitlements or whether they are continuing to remain victims of deception and exploitation at the hands of strong and powerful sections of the community and whether social and economic justice has become a meaningful reality for them or it has remained merely a teasing illusion and a promise of unreality, so that in case the complaint in the public interest litigation is found to be true, they can in discharge of their constitutional obligation root out exploitation and injustice and ensure to the weaker sections their rights and entitlements.[253]

PIL has transformed environmental jurisprudence in India. As highlighted previously, the right to a clean and safe environment is not a constitutional right, but a judicially interpreted right originating in the fundamental right to life.[254] PIL transformed the previously unrecognized status of the right to a clean and healthy environment to the most sought-after right. It expanded access to and implementation of environmental justice to all sections of society.[255] Relaxing the "locus standi" rules allowed for flexibility in the courts' approach to public issues and expanded the meaning of fundamental rights. The courts, through a combination of DPSP and fundamental rights, achieved a complete understanding of human rights, and, in many cases, applied several international standards for the implementation of human rights.

---

250. People's Union for Democratic Rights v. Union of India, (1983) 1 SCR 456, 466.

251. Fertilizer Corp. Kamgar Union v. Union of India, (1981) 2 SCR 52 (1980).

252. Ramsharan Autyanuprasi v. Union of India, AIR 1988 SC 549.

253. State of Uttaranchal v. Balwant Singh Chaufal, (2010) 3 SCC 402 (India).

254. *See* INDIA CONST. art. 51A § g (describing only citizen's duties to protect the environment, not a constitutional right to a clean environment); State of Uttaranchal v. Balwant Singh Chaufal, (2010) 3 SCC 402, ¶ 45 (India) (describing the development of PIL and dividing it into three phases, with the second phase relating to environmental cases).

255. Jona Razzaque, *Linking Human Rights, Development, and Environment: Experiences from Litigation in South Asia*, 18 FORDHAM ENVTL. L. REV. 587, 592 (2006).

Importantly, the recognition of the right to a clean and safe environment in India is a result of PIL. PIL repeatedly acted as a catalyst for the "judicial democracy" movement by transforming the courts into a "liberated agency with a high socio-political visibility" from its narrow traditional role.[256]

3. From Law Interpreter to Law Making Role

The Supreme Court deviated from its traditional role of law interpreter to law maker when it interpreted Part III and IV of the Constitution. Article 32 creates a fundamental right which guarantees access to a judicial remedy at the Supreme Court for fundamental rights violations.[257] Litigants have invoked Article 32, resulting in the court granting writs of mandamus, certiorari, and prohibition against public bodies for failing to execute their duties to protect the environment.[258]

Through writ petitions and PIL, the Supreme Court relaxed the rules of locus standi and widened access to the poorest and downtrodden.[259] PIL allowed for prompt judicial action in human rights violations cases, bettering the living conditions of many individuals.[260] Environmental law cases saw the development of a strong, vibrant, and dynamic jurisprudence parallel to international environmental law. These cases incorporated several principles like polluter pays, the precautionary approach, public trust, and absolute liability, shifting the court to a rule-making role.

In the *Oleum Gas Leakage* case, the court modified the English principle of strict liability to create the absolute liability principle to suit the needs of present social and economic situations.[261] *Ryland v. Fletcher* established that a landowner has strict liability for anything likely to cause harm being brought to and collected on his land if that thing escapes and causes damage to another.[262] This rule's many exceptions—Acts of God, acts of strangers, and consent—has been found to be unsuitable to address present-day

256. Upendra Baxi, *Taking Suffering Seriously: Social Action Litigation in the Supreme Court of India*, *in* 4 THIRD WORLD LEGAL STUDIES 107, 107–08 (1985).

257. INDIA CONST. art. 32, § 1.

258. *See*, *e.g.*, Rampal v. State of Rajasthan, AIR 1981 (Raj.) 121 (issuing a writ of Mandamus to the Municipal Board to construct proper sewers and drains); Bangalore Med. Tr. v. B.S. Muddappa, (1991) 3 SCR 102 (India) (finding that residents of a locality have locus standi the challenge the action of the authorities); Singh v. State of Uttar Pradesh., (1964) 1 SCR 332 (1962) (India) (issuing a writ of mandamus directing the police not to continue domiciliary visits).

259. Bangalore Med. Tr. v. B.S. Muddappa, (1991) 3 SCR 102 (India).

260. Ashok H. Desai & S. Muralidhar, *Public Interest Litigation: Potential and Problems, in* SUPREME BUT NOT INFALLIBLE – ESSAYS IN HONOUR OF THE SUPREME COURT OF INDIA 159, 165 (B.N. Kirpal et al eds., 2000).

261. M.C. Mehta v. Union of India, AIR 1998 SC 1037.

262. Rylands v. Fletcher [1868] UKHL 1, LRE & I. App. (HL) 330 (appeal taken from Eng.).

challenges.[263] Thus, the Court established the absolute liability principle, which was later adopted in the 1991 Public Liability Insurance Act.[264] Justice Bhagwati explained:

> an enterprise which is engaged in a hazardous or inherently dangerous industry which poses a potential threat to the health and safety of the persons working in the factory and residing in the surrounding areas owes an absolute and nondelegable duty to the community to ensure that no harm results to anyone on account of hazardous or inherently dangerous nature of the activity which it has undertaken.[265]

Courts have applied the polluter pays principle in cases that inspired its duty to protect the environment and people.[266] The Court noted that "polluting industries are absolutely liable to compensate for the harm caused by them to villagers in the affected area, to the soil and to the underground water and hence, they are bound to take all necessary measures to remove sludge and other pollutants lying in the affected areas."[267] Similarly, in *Vellore Citizens Welfare Forum* the court—combining the polluter pays and the precautionary principles—held that "[t]he 'Polluter Pays' principle . . . means that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environmental degradation. Remediation of the damaged environment is part of the process of 'Sustainable Development' . . . ."[268] After several subsequent cases following *Vellore,* Indian environmental law has adopted and established the combined polluter pays and precautionary principles.[269]

---

263. Shramanad Wibedi, *A Critical Analysis of Strict and Absolute Liability*, http://www.legalservicesindia.com/article/2155/Strict-and-Absolute-Liability.html (last visited Feb. 7, 2019).

264. Public Liability Insurance Act, NO. 6 of 1991, INDIA CODE (1992).

265. M.C. Mehta v. Union of India, (1987) 1 SCR 819.

266. S*ee* M.C. Mehta v. Union of India, (1987) 1 SCR 819 (recognizing the "Polluter Pays" principle for the first time in India, establishing that anyone causing harm to the environment faces strict liability); s*ee*, *e.g.,* M.C. Mehta v. Kamal Nath, (1997) 1 SCC 388 (India) (arguing that the "Polluter Pays" principle has been established as the law of the land and that violators face "absolute liability" to those that suffer harm and also for the costs of restoring environmental loss through "sustainable development" efforts).

267. Indian Council for Enviro-Legal Action v. Union of India, AIR 1996 SC 1446.

268. Vellore Citizens Welfare Forum v. Union of India, 1996 AIR SC 2715.

269. Research Foundation for Science Technology National Resource Policy v. Union of India, (2005) 13 SCC 186; Andhra Pradesh Pollution Control Board v. M.V. Nayudu, (1999) 2 SCC 718 (India); Indian Council for Enviro-Legal Action v. Union of India, AIR 1996 SC 1446.

In yet another development, the Court introduced the public trust doctrine for the protection of natural resources.[270] The doctrine, which impresses upon the State a duty to protect natural resources for the enjoyment of the public rather than lending it for private persons or commercial interests, envisages the State as a trustee who holds these resources for the beneficiary.[271] The public trust doctrine has been applied in the conservation of a river, and later to several other natural resources.[272] In many cases, the law-making role of the courts has filled the gaps in legislation. However, this active judicial role is against the principle of the separation of powers and is seen as an intrusion on legislature's powers.[273] Yet, this activism has created several human rights—some from already existing rights and some new—and reminded the State of its public duty, holding the State accountable to the people.

IV. FEMINIST ANALYSIS OF THE RIGHT TO ENVIRONMENT IN INDIA

This section examines the right to a clean and safe environment in India from a gendered perspective. As explained in previous sections, the right to a clean and safe environment is considered an essential part of the right to life—a fundamental right guaranteed by the Constitution. It should be noted that there are no clear judicial decisions on the parameters defining a clean and safe environment. This right to a clean and safe environment is not confined to any specific gender or species because environmental degradation affects all living organisms. However, there are some individuals who are affected more than others due to their closer interactions with the environment. This section aims to explore the right to a clean and safe environment through a woman's eye. The water and sanitation sectors will act as the means to understanding and examining this right. These sectors are intimately related to feminist issues, because none of these rights—the right to a clean and safe environment, water, and sanitation—have received legislative recognition.

---

270. M.C. Mehta v. Kamal Nath, (1996) 1 SCC 388 (India).

271. Paul A. Barresi, *Mobilizing the Public Trust Doctrine in Support of Publicly Owned Forests as Carbon Dioxide Sinks in India and the United States*, 23 COLO. J. INT'L L. & POL'Y 39, 57 (2012).

272. M.C. Mehta v. Kamal Nath, (1996) 1 SCC 388 (India).

273. Rehan Abeyratne & Didson Misri, *Separation of Powers and the Potential for Constitutional Dialogue in India*, 5 J. INT'L & COMP. L. 363, 373 (2018).

A. Water

1. Human Right to Water

In India, water—like the environment as a whole—is recognized as essential to the right to life.[274] Several international, regional, and national instruments have recognized the right to water. Internationally, this right has been strengthened explicitly by the United Nations High Commission for Refugees General Comment 15.[275] Although no international human rights treaties—except the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW)[276] and Convention on the Rights of the Child (CRC)[277]—explicitly mentions the right to water, the status of water as a derivative right remains intact.[278] As a derivative right, water is an essential right derived from or interconnected to other rights like health, life, food, and housing.[279]

At the international level, Article 6 of the ICCPR provides that everyone has an inherent right to life which cannot be deprived arbitrarily.[280] It follows, then, that the non-discrimination provision includes the right to water, being closely linked to the right to life. Articles 11 and 12 of ICESCR also underline the essential status of water. Article 11 recognizes the right to an adequate standard of living, including: adequate food, clothing, housing, and the opportunity to experience the continuous improvement of one's living conditions.[281] Similarly, under Article 12, states are obligated to adopt necessary measures for the progressive realization of these rights, which include the enjoyment of the highest standard of physical and mental health.[282] The right to water, implied in these convention rights, must also share human right status.

However, the CEDAW explicitly recognizes water as a right which every state is bound to provide and ensure to all women. This Convention for the protection of women and their rights requires member states to eliminate

---

274. Attakoya Thangal v. Union of India, AIR 1990 (Kerala) 321; Kumar v. State of Bihar, (1991) 1 SCR 5 (India).

275. U.N. Comm. on Economic, Social and Cultural Rights, General Comment No. 15: The Right to Water, ¶¶ 1,4, U.N. Doc. E/C.12/2002/11 (Jan. 20, 2003) [hereinafter General Comment 15].

276. Convention on the Elimination of All Forms of Discrimination Against Women art. 14(h), Dec. 18, 1979, 34 U.N.T.S. 180.

277. Convention on the Rights of the Child, Nov. 20, 1989, 1577 U.N.T.S. 3.

278. Stephen C. McCraffrey, *Human Right to Water*, 5 GEO. INT'L ENVTL. L. REV. 1, 7, 12 (1992).

279. Amanda Cahill, *The Human Right to Water–A Right of Unique Status: The Legal Status and Normative Content of the Right to Water*, 9 INT'L J. HUM. RTS. 389, 391 (2005).

280. International Covenant on Civil and Political Rights, *supra* note 2, at art. 6

281. ICESCR, *supra* note 3, at art. 11.

282. *Id.* at art. 12.

discrimination against women.[283] The states shall consider and address the particular problems that rural women face and adopt appropriate measures to eliminate all discrimination against women; this ensures that women have adequate access to, among other things, health care facilities, education, and adequate living conditions—particularly sanitation, water supply, and housing.[284] Recognizing this duty to provide access to clean water has been regarded as a step to ease the burden on women as water-collectors in third-world countries where they face several hardships in exercising this right.[285]

In 2010, the United Nations General Assembly established the right to safe and clean water as a human right essential for the full enjoyment of life and all human rights.[286] The General Assembly called upon member states and international organizations to provide financial resources and support capacity-building and technology-transfer endeavors through international assistance and cooperation—with particular attention given to developing countries—in order to scale up efforts to provide safe, clean, accessible, and affordable drinking water and sanitation for all.[287]

General Comment 15 stresses everyone's human right to safe, adequate, physically accessible, and affordable water for personal and domestic use.[288] The right to water, which contains both "freedoms and entitlements," requires states to ensure that everyone enjoys this right without discrimination based on "race, colour, sex, age, language, religion, political or other opinion, national or social origin, property, birth, physical or mental disability, health status (including HIV/AIDS), sexual orientation and civil, political, social or other status."[289] While the right to maintain access to existing water supplies and the right to be free from arbitrary interference form freedoms, the right to a system of water supply and management that provides equal opportunity to enjoy it constitutes an entitlement.[290] Water, which is to be treated more as a social and cultural good than an economic good, must be consistently provided to all.[291] This means that actualizing these rights considers the special needs of individuals who have traditionally faced discrimination in exercising their rights, including: women, children,

283. Convention on the Elimination of All Forms of Discrimination Against Women, *supra* note 276, at arts. 1–2.

284. *Id*. at art. 14.

285. KNUT BOURQUAIN, FRESHWATER ACCESS FROM A HUMAN RIGHTS PERSPECTIVE: A CHALLENGE TO INTERNATIONAL WATER AND HUMAN RIGHTS LAW 123 (2008).

286. G.A. Res. 64/292, The Human Right to Water and Sanitation (July 28, 2010).

287. *Id.*

288. General Comment 15, *supra* note 275, ¶ 2.

289. *Id.* ¶ 13.

290. *Id.* ¶ 10.

291. *Id.* ¶ 11.

minorities, indigenous people, refugees, asylum-seekers, internally displaced persons, migrant workers, prisoners, and detainees.[292]

The states are obligated to "respect, protect and fulfill" equal rights to a water supply and services, as well as ensure non-discrimination.[293] This obligation requires states to refrain from interfering with the enjoyment of this right.[294] This means that the state is obligated to protect water users from third-party interference.[295] Hence this right not only makes the state duty-bound to protect water users' rights from its own activities, but also makes it responsible for overseeing the activities of other third-parties. Combined, this ensures that the right to water is a collective responsibility of state and non-state actors involved in distribution, control, and management of water resources.

The state should not only respect and protect this right, but also fulfill its obligations to ensure this right for citizens. This duty includes "the obligations to facilitate, promote and provide."[296] The obligatory language envisions the state taking positive measures to assist in the enjoyment of this right, improving awareness of the use and conservation of water, and adopting necessary legislative and policy measures for recognizing and implementing the right to water on a national level.[297]

Thus, the human right to water is recognized on an international level as a right derived from other rights. The right to water is specifically recognized for its significance to the enjoyment of the right to life, while other essential rights—like the right to food and the right to health—have independent existence from the right to life.[298] Clearly, "there is no right to the single most important resource necessary to satisfy the human rights more explicitly guaranteed by the world's primary human rights declarations and covenants."[299] Considering the significance of water in everyday life and its impacts on life, livelihood, and health, water has received significant attention from a number of nations worldwide.[300]

---

292. *Id.* ¶ 16.
293. *Id.* ¶ 20.
294. *Id.* ¶ 21.
295. *Id.* ¶ 23. Third parties can include individuals, groups, corporations, or any public bodies. *Id.*
296. *Id.* ¶ 25.
297. *Id.* ¶ 26.
298. Peter H. Gleick, *The Human Right to Water*, 1 WATER POL'Y 487, 490 (1998).
299. *Id.* at 493.
300. *Id.* at 489–90 ("There is an extensive body of covenants and international agreements formally identifying and declaring a range of human rights.").

2. Human Right to Water in India

Several nations have recognized and implemented the human right to water.[301] South Africa has an elaborate provision on the right to water, which its Constitution explicitly mentions.[302] This provision places a duty on the State to adopt necessary measures to implement the right to water.[303]While India has developed human-rights jurisprudence that has influenced several other developing countries, the right to water is without legislative reference. Instead, as described above, the judiciary created the right as being inferred from the right to life, an explicit right under Article 21 of the Constitution.[304]

There is no legislative framework for the right to water, and the existing legal acknowledgement of the right has not yet been codified into law.[305] The Government of India Act 1935, which granted the States power over water supply and drainage, influenced the current water-law framework.[306] The Constitution grants the states power over waters within the states, but retains the power over interstate rivers and river disputes for the central government.[307] A decentralization drive, initiated under the 73rd and 74th Amendment Act, provided additional power to local governments and panchayat raj (self-government) institutions to control water supply and drainage.[308] Together, these provisions have adopted a duty-based approach rather than a rights-based approach to fulfill a demand-driven water supply. The right to water has neither been recognized nor stressed through these constitutional provisions.

Nevertheless, recent water policies have recognized this rights-focused approach, which, due to their nonbinding nature, remain only a policy statement. The National Water Policy of 2012 acknowledged the fundamental nature of water and its significance and contribution to life and livelihood, and called for a national framework to manage and conserve the

---

301. *See* U.N. OFFICE OF THE HIGH COMM'R FOR HUMAN RIGHTS, FACT SHEET NO. 35: THE RIGHT TO WATER, at 7, 40, 47 (2010) (noting that nations such as Bolivia, Cambodia, Columbia, India, Eritrea, Ethiopia, Gambia, South Africa, and Uganda have all recognized the human right to water).

302. S. AFR. CONST., 1996, sec. 27(1)(b).

303. *Id.*; *see generally* David Takacs, *South Africa and the Human Right to Water: Equity, Ecology, and the Public Trust Doctrine*, 34 BERKELEY J. INT'L L. 55 (2016) (discussing South Africa's recognition of a right to water); Anél du Plessis, *A Government in Deep Water? Some Thoughts on the State's Duties in Relation to Water Arising from South Africa's Bill of Rights,* 19 REV. EUROPEAN COMMUNITY & INT'L ENVTL. L. 316 (2010) (discussing South Africa's recognition of a right to water).

304. Philippe Cullet, *Water Sector Reforms and Courts in India Lessons from the Evolving Case Law*, 19 REV. OF EUROPEAN COMMUNITY & INT 'L ENVTL. L. 328, 329 (2010).

305. *Id.*

306. Government of India Act 1935, § 130–4 (Eng.).

307. INDIA CONST. art. 246, sched. 7, list II § 17; *id.* at art. 246, sched. 7, list I § 56.

308. *Id.* at art. 243G, sched. 11 § 3; *id.* at art. 243W, sched. 12 § 5.

country's water resources.[309] The latest draft, the National Water Framework Bill, explicitly highlights that water is a fundamental right which guarantees that "[e]very person has a right to sufficient quantity of safe water for life within easy reach of the household regardless of, among others, caste, creed, religion, community, class, gender, age, disability, economic status, land ownership and place of residence."[310]

The right to water has also been derived by judicial pronouncements by the Indian Supreme Court and the High Courts of various states.[311] Since the early 1990s, various judgments have highlighted this right—like the right to a clean and safe environment—as a prerequisite for, or an essential component of, the right to life. In many cases, the courts have reminded the states of their duty to supply water and safeguard public health.[312] Surprisingly, this rights-duty reminder remains the crux of all judgments without any reference to the specific issues that women face. This is further complicated in the groundwater sector where the land-water nexus determines access and control over the resources.[313]

3. Gender Issues in Water

Scarcity and water quality issues, as well as sanitation, have significant impacts on the lives and livelihood choices of people living all over the world. Currently, it is estimated that more than two billion people lack safe drinking water sources and that by 2050 at least one in four people are likely to live in a country affected by severe water scarcity.[314] In those houses

309. MINISTRY OF WATER RES., GOV'T OF INDIA, NATIONAL WATER POLICY 1.1 (2012).

310. MINISTRY OF JALSHAKTI, GOV'T OF INDIA, DRAFT NATIONAL WATER FRAMEWORK BILL [DRAFT] 7 (2016).

311. *See*, *e.g.*, F.K Hussain v. Union of India, AIR 1990 (Ker) 321 (discussing the right to water in India); Venkatagiriyappa v. Karnataka Electricity Bd., (1999) 4 KarLJ 482 (India) (discussing the right to water in India); Kumar v. State of Bihar, (1991) 1 SCR 5 (India) (discussing the right to water in India); Narmada Bachao Andolan v. Union of India, (2000) 10 SCC 664, ¶¶ 1–4 (discussing the right to water in India).

312. Vishala Kochi Kudivella v. State of Kerala, (2006) 1 KLT 919 (India).

313. CHHATRAPATI SINGH, WATER RIGHTS AND PRINCIPLES OF WATER RESOURCES MANAGEMENT 39 (1991); Marcus Meonch, *Approaches to Groundwater Management: To Control or Enable?*, ECON. & POL. WKLY., Sept. 24, 1994, at A-135 (discussing difficulties of groundwater management systems in India); Philippe Cullet, *Groundwater Law in India: Towards a Framework Ensuring Equitable Access and Aquifer Protection*, 26 J. ENVTL. L. 55, 56–57 (2014); Sujith Koonan, *Groundwater: Legal Aspects of the Plachimada Dispute*, *in* WATER GOVERNANCE IN MOTION: TOWARDS SOCIALLY AND ENVIRONMENTALLY SUSTAINABLE WATER LAWS 159, 169–71 (Philippe Cullet et al. eds., 2010).

314. *Goal 6: Ensure Access to Water and Sanitation for All*, https://www.un.org/sustainabledevelopment/water-and-sanitation/ (last visited Mar. 19, 2020); UNITED NATIONS, THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2019 9 (2019); UNITED NATIONS, THE UNITED NATIONS WORLD WATER DEVELOPMENT REPORT 2018: NATURE-BASED SOLUTIONS FOR WATER 13 (2018).

without access to a piped water supply, women and girls often perform the role of water collectors, as is the case in India.[315]

"Gendered power and hegemonic masculinities"[316] have always been a part of water governance.[317] Women face inequalities in accessing resources, the division of labor, and water governance structures.[318] The right to equality and non-discrimination based on caste and gender has not yet been fully implemented to realize the empowerment of women and actualization of their rights.[319]

Women engage in the management of water in ways that are often regulated by informal rules and arrangements that go unnoticed by the State.[320] When the State manages water through its formal water laws and policies, it displaces many of these customary traditional rights enjoyed by women and turn women into beneficiaries rather than right holders.[321] In traditional roles of drinking water security, the existing water laws do not address the specific issues that women face. Women often spend hours collecting water, thereby sacrificing their health, access to schools, and other societal benefits.[322] Similarly, in irrigation-water users associations, it has been pointed out that women water users often remain as participants rather than active members.[323] Meinzen-Dick and Zwarteveen note that the male-dominated membership rules of water-user associations are based on property ownership, which hinders women's access to these associations despite their active participation in water management at informal levels.[324]

Water policies and laws lack gender dimensions due to their universality. Women and girls have more vibrant and intimate relationships with the environment and water.[325] Thus, women deserve more attention due to their role in water conservation and management.

---

315. Kate Darling, *A Weight for Water: An Ecological Feminist Critique of Emerging Norms and Trends in Global Water Governance*, 13 MELB. J. INT'L L. 368, 384 (2012); *see* Warren, *supra* note 161, at 7 (explaining that in the southern hemisphere woman do most of the water collection).

316. Margreet Z. Zwarteveen, *The Politics of Gender in Water and the Gender of Water Politics*, *in* POLITICS OF WATER: A SURVEY 184, 186 (Kai Wegerich & Jeroen Warner eds., Routledge 2010).

317. Darling, *supra* note 315, at 379.

318. Amit Mitra & Nitya Rao, *Gender, Water, and Nutrition in India: An Intersectional Perspective*, 12 WATER ALTERNATIVES 169, 169 (2019).

319. INDIA CONST. art. 14–15.

320. Lahiri-Dutt, *supra* note 5, at 276–77.

321. *Id.* at 276.

322. Caruso, *supra* note 155.

323. *See* Ruth Meinzen-Dick & Margreet Zwarteveen, *Gendered Participation in Water Management: Issues and Illustrations from Water Users' Associations in South Asia*, 15 AGRIC. & HUM. VALUES 337, 339 (1998) (discussing the gender roles within irrigation systems).

324. *Id.* at 340.

325. *See* Caruso, *supra* note 155 (describing the hours women spend dealing with water and their knowledge of the crisis).

V. CONCLUSION

When it comes to actualizing rights, the environment and gender are interrelated. The right to a clean and safe environment has been recognized as a human right in many international treaties and domestic constitutions.[326] However, these rights are recognized for the development and enjoyment of other human rights—especially the right to life. Therefore, the right to a clean and safe environment is a derivative right, though it is widely recognized now as an essential human right. The right to a clean and safe environment is not only a human right, but a right essential and fundamental for the existence of nature, humans, and non-human species.

To date, this discussion of environmental rights has negated the specific rights of women and their relationship with the environment. Eco-feminists have discussed subjugation of women and nature, but discussions from a legal perspective are lacking. India has an elaborate jurisprudence on the right to a clean and safe environment. This right has been discussed as being either derived from, a prerequisite to, or a part of the right to life guaranteed under Article 21 of the Constitution.[327] The courts have acknowledged this right by incorporating several environmental protection principles. The courts have also frequently reminded states of their duty to protect the environment. Yet these judicial interventions have not expanded their analyses of these rights to consider the specific issues that women and girls are faced with.

The right to water is also a fundamental right. Here, this right was analyzed within the context of the interrelation between women and the environment. As with the right to a clean and safe environment, the Indian courts have not mentioned the female-specific aspects of this right. Given the close relationship between women's rights with the right to a clean and safe environment and the right to water, these rights should be analyzed through the lens of women's rights. This will allow society to understand the problems that women face, highlight their contributions, and ensure equitable access, management, and control of resources.

---

326. *See, e.g.*, *Rio Declaration*, *supra* note 79, at art. 145 (stating a right to a clean environment); Art. 41, CONSTITUCIÓN NACIONAL [CONST. NAC.] (Arg.) (stating a right to a clean environment); HONDURAS CONSTITUTION OF 1982, art. 145 (stating a right to access water and sanitation).

327. Subhash Kumar v. State of Bihar, (1991) 1 SCC 598 (India).

COMPARING RECENT FEDERAL AND STATE ATTEMPTS AT LEGISLATION PROMOTING SHARK CONSERVATION: A FAILURE OF COOPERATIVE FEDERALISM?

David E. Jennings*

Sharks aren't gods and they're not devils. I regard them as true lords of time. They've survived multiple extinction episodes when most marine animals have disappeared. They've had the strength and adaptations to come back time and time again, and they've been around probably longer than most animals with backbones – nearly half a billion years! But now humans, the super-predator, threaten to undo the half-billion-year reign of sharks. And the sad fact is that we're killing them off to make soup out of their fins![1]

* J.D., 2020, Vermont Law School; Ph.D., 2011, University of South Florida; M.Sc., 2005, University of Surrey-Roehampton; B.Sc., 2004, University of Surrey-Roehampton. I would like to thank Greg Johnson, Don Baur, Heather Rally, Sadie Jacobs, and Amanda Cargile for their helpful comments and suggestions.

1. Save Our Seas Foundation, *Project Leader: Samuel H. Gruber*, www.saveourseas.com/project-leader/sam-gruber (last visited Feb. 18, 2020).

I. INTRODUCTION

We are in the midst of the sixth mass extinction.[2] Indeed, a forthcoming report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services found that around one million plants and animals are threatened with extinction.[3] Human overexploitation of organisms is the second leading driver of extinction.[4] Illegal wildlife trade fuels the overexploitation of many species, and urgent action is necessary to prevent further "biological annihilation" of the world's biodiversity.[5]

Sharks are a particularly maligned and threatened group. Overfishing is largely responsible for shark population declines in recent decades.[6] Many sharks are caught as bycatch, while some fisheries directly target certain sharks for meat.[7] Perhaps the most notorious and abhorrent fisheries practice is shark finning. Finning sharks involves removing the fins of an individual and discarding the body back into the water.[8] Often still alive but unable to move, the animals either drown, bleed to death, or are eaten by other predators.[9] Shark fins are frequently harvested from threatened or

2. Anthony Barnosky et al., *Has Earth's Sixth Mass Extinction Already Arrived?*, 471 NATURE 51, 51 (2011) (characterizing mass extinctions as "times when the Earth loses more than three-quarters of its species in a geologically short interval." Five previous mass extinctions are documented in the fossil record, and research indicates that current extinction rates are headed towards those levels previously observed).

3. UNITED NATIONS SUSTAINABLE DEV. GOALS, *UN Report: Nature's Dangerous 'Unprecedented'; Species Extinction Rates 'Accelerating'* (May 6, 2019), https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/.

4. *Id.*

5. Gerado Ceballos et al., *Biological Annihilation via the Ongoing Sixth Mass Extinction Signaled by Vertebrate Population Losses and Declines*, 114 PROCEEDINGS NAT'L ACAD. SCI. U.S. 7731, E6089, E6095 (2017).

6. Julia K. Baum et al., *Collapse and Conservation of Shark Populations in the Northwest Atlantic*, 299 SCI. 389, 390 (2003).

7. *Id.* at 389.

8. PATRICK MUSTAIN ET AL., SHARK FIN TRADE: WHY IT SHOULD BE BANNED IN THE UNITED STATES 1 (2016).

9. *Id.*

endangered species, such as great hammerheads (*Sphyrna mokarran*), among others.[10]

Public opposition to shark finning led to the implementation of several federal and state laws in the United States promoting shark conservation. This article examines how effective those laws have been and assesses recent efforts to improve legal protections for sharks. Part II provides a brief background on shark ecology and conservation, and the history and significance of shark finning. Part III discusses domestic management of shark fisheries. Part IV describes some of the problems with current laws. Part V analyzes and compares potential solutions to the problems with current laws. Part VI concludes that the present combination of federal and state law is insufficient to protect these animals, and that stronger federal law is necessary to create comprehensive and unified prohibitions on trade in shark products.

II. BACKGROUND

There are over 500 shark species found throughout the world's oceans.[11] They range in various life-history characteristics, from 20-centimeter-long dwarf lanternsharks (*Etmopterus perryi*) to colossal 20-meter-long whale sharks (*Rhincodon typus*).[12] Generally, sharks are relatively slow to mature and are long-lived; some species may even live for over 400 years.[13] Many sharks are also apex predators (i.e., top predators) in their food webs.[14] Apex predators often exert top-down control of mesopredators (i.e., intermediate predators) and herbivores in ecosystems.[15] Consequently, removing apex predators such as sharks from ecosystems causes a myriad of effects on other taxa.[16]

Overfishing and shark finning are by no means the only threats facing sharks. Like most other species, sharks are threatened by habitat loss and

10. Shelley C. Clarke et al., *Identification of Shark Species Composition and Proportion in the Hong Kong Shark Fin Market Based on Molecular Genetics and Trade Records*, 20 CONSERVATION BIOLOGY 201, 209 (2006).

11. *Sharks FAQ*, FLA. MUSEUM OF NAT. HISTORY, https://www.floridamuseum.ufl.edu/discover-fish/sharks/faq/ (last visited Mar. 23, 2020).

12. *Id.*

13. Julius Nielsen et al., *Eye Lens Radiocarbon Reveals Centuries of Longevity in the Greenland Shark (Somniosus Microcephalus)*, 353 SCI. 702, 702 (2016).

14. *Id.*

15. Benjamin Feit et al., *Apex Predators Decouple Population Dynamics Between Mesopredators and Their Prey*, 22 ECOSYSTEMS 1606, 1607 (2019).

16. Ransom A. Myers et al*., Cascading Effects of the Loss of Apex Predatory Sharks from a Coastal Ocean,* 315 SCI. 1846, 1846–47 (2007); Timothy Morris & Mike Letnic, *Removal of an Apex Predator Initiates a Trophic Cascade That Extends From Herbivores to Vegetation and the Soil Nutrient Pool*, 284 PROC. ROYAL SOC'Y BIOLOGICAL SCI. 1, 1 (2017).

climate change. For example, coastal development can destroy shark nursery habitat,[17] and ocean acidification affects reef ecosystems.[18] Along with many apex predators, sharks also face senseless persecution.[19] Habitat loss and climate change are complex threats involving many species, ecosystems, and stakeholders.[20] Compared to habitat loss and climate change, shark finning is arguably the most straightforward of these threats to address through legislation.

A growing body of evidence suggests fish are able to experience pain.[21] Further, sharks are intelligent animals capable of learning,[22] and some species display complex social behaviors more commonly associated with other vertebrates.[23] Cutting the fins off these animals before discarding them back into the water alive is an undeniably cruel practice. Recent documentaries such as *Sharkwater,*[24] *Racing Extinction*,[25] and even Gordon Ramsay's *Shark Bait*,[26] brought this gruesome activity to audiences around the world. Consequently, public outcry over the methods used to obtain shark fins galvanized momentum towards strengthening existing shark conservation laws.

The international demand for shark fins primarily is for shark fin soup. Fins from up to 73 million sharks are used in soup every year.[27] Shark fin soup traditionally was a delicacy in China and remained popular with

---

17. *See generally* David Jennings et al., *Effects of Large-Scale Anthropogenic Development on Juvenile Lemon Shark (Negaprion brevirostris) Populations of Bimini, Bahamas*, 83 ENVTL. BIOLOGY OF FISHES 369 (2008) (discussing effect of development on juvenile lemon sharks).

18. Andrew Chin et al., *An Integrated Risk Assessment for Climate Change: Analysing the Vulnerability of Sharks and Rays on Australia's Great Barrier Reef*, 16 GLOBAL CHANGE BIOLOGY 1936, 1942 (2010).

19. Nicholas K. Dulvy et al., *Extinction Risk and Conservation of the World's Sharks and Rays,* ELIFE, Jan. 21, 2014, at 1, https://elifesciences.org/articles/00590.

20. J.M.J. Travis, *Climate Change and Habitat Deconstruction: A Deadly Anthropogenic Cocktail*, 270 PROC. ROYAL SOC'Y BIOLOGICAL SCI. 467, 467 (2003).

21. Lynne U. Sneddon et al., *Ample Evidence for Fish Sentience and Pain*, 162 ANIMAL SENTIENCE 1, 3 (2018); Culum Brown, *Fish Intelligence, Sentience and Ethics*, 18 ANIMAL COGNITION 1, 16 (2015).

22. Tristan L. Guttridge et al., *The Role of Learning in Shark Behavior*, 10 FISH & FISHERIES 450, 452 (2009).

23. Tristan L. Guttridge et al., *Social Preferences of Juvenile Lemon Sharks*, 78 ANIMAL BEHAVIOR 543, 543–44 (2009).

24. SHARKWATER (Freestyle Releasing 2006).

25. *See We are Racing Extinction, and We Cannot Afford to Lose*, OCEANIC PRES. SOC'Y, https://www.opsociety.org/our-work/films/racing-extinction/ (last visited Feb. 6, 2020) ("*Racing Extinction* exposes the trafficking in wildlife and other crimes against nature in a race to protect all life from mass extinction.").

26. GORDON RAMSAY: SHARK BAIT (One Potato Two Potato 2011).

27. CHRISTINA VALLIANOS ET AL., SHARKS IN CRISIS: EVIDENCE OF POSITIVE BEHAVIORAL CHANGE IN CHINA AS NEW THREATS EMERGE 4 (2018).

Chinese Americans in the United States.[28] Apparently its use as a luxury dish began during the Song dynasty (960–1279 AD),[29] before its prestige grew further, after becoming incorporated into imperial banquets during the Ming Dynasty (1368–1644 AD).[30] Shark fin soup's popularity grew rapidly again in the 1990s as it gained notoriety as a luxury food item.[31] At the same time, many scientific studies began documenting declines in shark populations, suggesting that these declines may be related to increased demand for shark fins.[32]

Shark meat alone has relatively little value, and fins remain the most prized parts of sharks.[33] Although shark meat increasingly is consumed in certain markets, the demand for shark fins drives most shark fisheries.[34] A pound of dried shark fin can cost around $400,[35] though the price usually depends upon the species.[36] Restaurants then sell bowls of shark fin soup for between $50 and $200.[37] Thus, there is a lucrative market for shark fins in the U.S. and worldwide, which provides a strong incentive for fishermen to continue the practice.

There are legitimate conservation concerns over shark finning in addition to the purely ethical objections to the practice. For instance, 15.9% of sharks are listed in one of the International Union for Conservation of Nature's (IUCN) Red List threatened categories (i.e., critically endangered, endangered, or vulnerable).[38] Additionally, the Convention on International Trade in Endangered Flora and Fauna (CITES) lists 12 shark species.[39]Closer to home, two of these CITES-listed species (scalloped hammerheads,

---

28. Juliet Eilperin, *California Adopts Shark Fin Ban* (Sept. 7, 2011), https://www.washingtonpost.com/national/health-science/california-adopts-shark-fin-ban/2011/09/06/gIQACgsD9J_story.html.

29. Michael Fabinyi, *Historical, Cultural and Social Perspectives on Luxury Seafood Consumption in China*, 39 ENVTL. CONSERVATION 83, 87 (2011).

30. Shelley Clarke et al., *Social, Economic, and Regulatory Drivers of the Shark Fin Trade*, 22 MAR. RES. ECON. 305, 307 (2007).

31. *Id.* at 308.

32. *See* Carl Safina, *Where Have All the Fishes Gone?,* 10 ISSUES SCI. & TECH. 37, 39 (1994) (describing a 20-year monitoring study by the Virginia Institute of Marine Sciences).

33. Mustain, *supra* note 8, at 4.

34. *Id.* at 3.

35. Rachel Fobar, *Shark Fin is Banned in 12 U.S. States–But It's Still on the Menu* (Jan. 16, 2019), https://www.nationalgeographic.com/animals/2019/01/restaurants-sell-shark-fin-soup-despite-state-bans/.

36. Clarke et al., *supra* note 30, at 313.

37. Fobar, *supra* note 35.

38. Nearly half (45%) are listed as Data Deficient, meaning that the number of threatened species likely is a very conservative estimate. Dulvy et al., *supra* note 18, at 5.

39. *Sharks and Manta Rays*, https://www.cites.org/eng/prog/shark/more.php (last visited Mar. 16, 2020) ("As of October 2016, twelve species of sharks . . . are included in Appendix II, and none in Appendix I.").

Sphyrna lewini,[40] and Argentine angelshark, *Squatina argentina*[41]) are also listed under the U.S. Endangered Species Act (ESA). Population assessments for many species involved in the shark fin trade are either non-existent or outdated.[42] For example, blue sharks (*Prionace glauca*) are the species most commonly caught for their fins.[43] Blue shark populations have declined in many areas, but the IUCN last assessed them in 2005.[44] Further, 91.3% of fins in the global shark fin trade come from unsustainable sources.[45] Thus, shark finning is likely having a considerable impact on shark populations.

III. DOMESTIC MANAGEMENT OF SHARK FISHERIES

A. Federal Laws

Current federal laws provide sharks with limited protections. Although not specific to sharks, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that fishery management plans first prevent overfishing and rebuild stocks.[46] Initial efforts to specifically conserve sharks and prohibit finning derived from the MSA.[47]

Congress enacted the Shark Finning Prohibition Act of 2000 in response to concerns over shark population declines and finning in the 1990s. The stated purpose of this Act was "to eliminate shark-finning by addressing the problem comprehensively at both the national and international levels."[48] Specifically, it amended the MSA to make it unlawful to: "1) remove any of the fins of a shark (including the tail) and discard the carcass of the shark at sea; 2) have control or possession of such a fin aboard a fishing vessel without the corresponding carcass; or 3) land any such fin without the corresponding carcass."[49] Additionally, the Act added a rebuttable

40. Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Scalloped Hammerheads Sharks, 79 Fed. Reg. 38214, 38240–42 (to be codified at 50 C.F.R. pts. 223–224).

41. Endangered and Threatened Wildlife and Plants; Final Rule to List 6 Foreign Species of Elasmobranchs Under the Endangered Species Act, 82 Fed. Reg. 21722, 21740 (to be codified at 50 C.F.R. pts. 223–224).

42. *Id.*

43. Andrew Fields et al., *Species Composition of the International Shark Fin Trade Assessed Through a Retail-Market Survey in Hong Kong*, 32 CONSERVATION BIOLOGY 376, 386–87 (2017).

44. VALLIANOS ET AL., *supra* note 27.

45. Colin A. Simpfendorfer & Nicholas K. Dulvy, *Bright Spots of Sustainable Shark Fishing*, 27 CURRENT BIOLOGY MAG. R97, R98 (2017).

46. A.M.L. Int'l, Inc. v. Daley, 107 F. Supp. 2d 90, 93 (D. Mass 2000).

47. Magnuson-Stevens Fishery Conservation and Management Act of 1976, 16 U.S.C. §§ 1801–1884 (2018).

48. Shark Finning Prohibition Act of 2000, Pub. L. No. 106-557, § 1822, 114 Stat. 2772.

49. *Id.*

presumption that a violation occurs if the weight of the fins landed or on board exceeds 5% of the total weight of shark carcasses.[50] Although Congress intended this legislation to ban shark finning in U.S. waters, loopholes reduced its efficacy at preventing this practice.[51]

One of these loopholes enabled shark fins to be transferred between vessels at sea. In *U.S. v. Approximately 64,695 Pounds of Shark Fins*, the U.S. Coast Guard boarded the *King Diamond II*, a U.S.-flagged vessel, 250 miles off the Guatemalan coast.[52] The *King Diamond II* had been chartered by Tai Loong Hong Marine Products, Ltd. to procure shark fins from foreign vessels at sea and bring them to Guatemala.[53] The Coast Guard found the shark fins on board and presumed they were obtained through prohibited finning.[54] Consequently, the Coast Guard held the *King Diamond II* and brought it to San Diego.[55] The U.S. government then filed a complaint alleging that the fins should be forfeited under the MSA.[56]

Tai Loong Hong argued that the *King Diamond II* was not a fishing vessel under the MSA.[57] The Ninth Circuit agreed, holding that the statutory language did not give Tai Loong Hong fair notice that it would be considered a fishing vessel under the MSA.[58]

Another loophole in the Shark Finning Prohibition Act concerned the "fin-to-carcass" ratio method. This method is problematic because it potentially allows fishermen to mix and match shark parts and carcasses between those with valuable fins and those with more valuable meat.[59] The loophole in this method was exposed in *Etheridge v. Pritzker*.[60] There, the National Oceanic and Atmospheric Administration (NOAA) issued a notice of violation and assessment and a notice of permit sanction to fishermen after they admitted, on 18 occasions, that they possessed or landed shark fins in excess of 5% of the total weight of shark landed.[61] The fishermen argued they could rebut the finning presumption for various credible reasons, and the

50. *Id.*

51. Andrew Nowell Porter, *Unraveling the Ocean from the Apex Down: The Role of the United States in Overcoming Obstacles to an International Shark Finning Moratorium,* 35 ENVTL. L. & POL'Y J. 231, 242 (2012).

52. United States v. Approximately 64,695 Pounds of Shark Fins, 520 F.3d 976, 979 (9th Cir. 2008).

53. *Id.* at 977.

54. *Id.* at 979.

55. *Id.*

56. *Id.*

57. *Id.*

58. *Id.* at 980.

59. Mustain, *supra* note 8, at 8.

60. Etheridge v. Pritzker, No. 2:12-CV-79-BO, 2013 WL 6178575 at *1 (E.D.N.C. Nov. 25, 2013).

61. *Id.*

Administrative Law Judge agreed with them on five of the occasions.[62] However, the Eastern District of North Carolina reversed the decision, disagreeing with NOAA's interpretation of the rebuttable presumption. The court held that the fishermen need only show good reason for exceeding the 5% fin-to-carcass ratio and provide "reliable, credible, and probative" evidence in support.[63] Therefore, the standard for rebutting the finning presumption became much easier to satisfy.

The Shark Conservation Act of 2010 was Congress's response to the loopholes in the Shark Finning Prohibition Act. Indeed, the legislative history indicates that the Act's intent is to prevent U.S. flagged vessels from purchasing shark fins from fishermen on the high seas and returning them to the country.[64] This Act also replaced the fin-to-carcass ratio with a provision that fins remain naturally attached to carcasses.[65] However, the Shark Conservation Act still permits the import of shark fins into the U.S., and therefore inadvertently perpetuates shark finning elsewhere.

B. State Laws

States began enacting their own prohibitions on shark fins in response to the lack of effective federal legislation. Existing federal laws ban the practice of shark finning in U.S. waters and attempt to curb the shark fin trade. Conversely, state laws have much more explicitly targeted the trade in shark fins. At the time of writing, twelve states and three U.S. territories control the sale and possession of shark fins.[66]

Hawaii was the first state to prohibit possession of shark fins.[67] In 2010, Hawaii prohibited the "possession, sale, and distribution of shark fins."[68]

---

62. *Id.* at *6.

63. *Id.* at *7.

64. Jacqueline Baker, *Plight of an Ocean Predator: The Shark Conservation Act of 2010 and the Future of Shark Conservation Legislation in the United States*, 38 ENVIRONS ENVTL. L. & POL'Y J. 67, 93 (2014).

65. 16 U.S.C. § 1857 (1)(P)(iii) (2018).

66. *See generally Shark Finning Legislation*, ANIMAL WELFARE INST., https://awionline.org/content/shark-finning-legislation (last visited Feb. 6, 2020) (stating that the thirteen states and three territories (by date of enactment) are: Hawaii (2010), Commonwealth of the Northern Mariana Islands (2011), Guam (2011), American Samoa (2012), Washington (2012), Oregon (2012), California (2013), Maryland (2013), Illinois (2013), Delaware (2014), New York (2014), Massachusetts (2014), Texas (2016), Rhode Island (2017), and Nevada (2018). New Jersey will become the thirteenth state in 2021).

67. Rebecca Tatum, *Chapter 524: The Ecology and Controversy of Shark-Fin Soup*, 43 MCGEORGE L. REV. 667, 673 (2012).

68. HAW. REV. STAT. ANN. § 188-40.7 (West 2020).

Penalties include fines of $5,000–$15,000 for a first offense, and fines of $35,000–$50,000, along with up to one year in prison for a third offense.[69]

In 2013, California enacted its own Shark Fin Law controlling possession of shark fins.[70] California's penalties include up to six months in prison and fines up to $1,000.[71] The first conviction came in 2015.[72] This law was challenged in *Chinatown Neighborhood Association v. Harris*.[73] In *Chinatown*, the Neighborhood Association argued that the Shark Fin Law was preempted by the MSA because it would affect federal management of fisheries within the rest of the Exclusive Economic Zone. Specifically, the Neighborhood Association contended that the law "affect[ed] the ability of commercial fishers to reap the optimal yields prescribed in [Fisheries Management Plans] for shark harvests."[74] However, the Ninth Circuit held in favor of California, finding that the primary goal of the MSA is conservation.[75] Consequently, legislation promoting shark conservation is permissible under the MSA, and the Shark Fin Law is consistent with this goal.

Several other states appear poised to enact similar legislation in the near future. For instance, Connecticut is on the verge of passing H.B. No. 5251.[76] This bill prohibits the sale, trade, or distribution of shark fins in the state.[77] Violators could be fined up to $500, imprisoned for up to three months, or both.[78] While states have been relatively slow to adopt shark finning legislation, their combined efforts indicate growing bipartisan support for a national ban on the sale and possession of shark fins.

IV. PROBLEMS WITH CURRENT LAWS

Ideally, the state and federal laws presented above would provide an example of cooperative federalism; where the federal laws are insufficient, states are free to address the deficiencies. State laws prohibiting the sale and possession of shark fins certainly are commendable in the absence of more stringent federal law. However, data increasingly suggest that the assortment

69. *Id.*
70. CAL. FISH & GAME CODE § 2021 (West 2020).
71. *Shark Finning Legislation*, *supra* note 66.
72. Dan Noyes, *I-Team: San Francisco Man Convicted of Selling Shark Fins* (May 8, 2015), https://abc7news.com/business/i-team-san-francisco-man-convicted-of-selling-shark-fins/708114/.
73. Chinatown Neighborhood Ass'n v. Harris, 794 F.3d 1136, 1142 (9th Cir. 2015).
74. *Id.* at 1144.
75. *Id.* at 1143.
76. THE ASSOCIATED PRESS, *Bill Banning Sales of Shark Fins Awaits Senate Vote* (May 26, 2019), https://www.wtnh.com/news/politics/bill-banning-sales-of-shark-fins-awaits-senate-vote/2029153613/.
77. *Id.*
78. *Id.*

of state laws actually has the perverse effect of shifting trade to other states without legislation. Or, as put by marine scientist Mariah Pfleger, these assorted state laws can create a "whack-a-mole situation" for the shark fin trade.[79]

For example, California and New York banned shark fin imports in 2013 and 2014, respectively. At that time, California represented the largest U.S. market for shark fin consumption.[80] The shark fin trade grew by 240% in Texas after the passage of bans in other states.[81] After Texas made it illegal to buy, sell, or transport shark fins, significant trade shifted to Georgia.[82] Since 2015, Miami, Florida has been the leading port for shark fins.[83]

Challenges with cooperative federalism within the illegal wildlife trade are not unique to shark finning. A similar pattern emerges with ivory bans. For instance, after California and New York banned trade in ivory, the trade shifted to Washington D.C., Nevada, and Florida.[84] Similar comparisons can be made between the wildlife trade and other restricted trades, such as the gun trade. Despite Chicago's high levels of gun violence, it has some of the strictest gun laws in the country.[85] Meanwhile, the neighboring states of Indiana and Wisconsin do not.[86] Consequently, 60% of guns used in crimes come from outside of Illinois, with Indiana and Wisconsin being significant sources of those weapons.[87]

State shark fin bans may even have failed to eliminate the trade within their borders. Some restaurants in as many as ten of the twelve states with bans continue to serve shark fin soup.[88] Moreover, significant amounts of shark fins still enter the U.S. through the Port of Los Angeles every year.[89]

---

79. Jenny Staletovich, *Miami Now Nation's Top Importer of Shark Fins. Many States Have Banned the Product* (May 2, 2018), https://www.miamiherald.com/news/local/environment/article210157954.html.

80. Eilperin, *supra* note 28.

81. Press Release, Oceana, Texas Becomes 10th State to Ban Trade of Shark Fins (June 22, 2015), https://usa.oceana.org/press-releases/texas-becomes-10th-state-ban-trade-shark-fins.

82. Saeed Kamali Dehghan, *Marine 'Gold Rush': Demand for Shark Fin Soup Drives Decimation of Fish* (June 4, 2019), https://www.theguardian.com/environment/2019/jun/04/marine-gold-rush-demand-shark-fin-soup.

83. Staletovich, *supra* note 79.

84. Jen Fifield, *Proposed Bans on Ivory Sales Halted by Interest Groups* (Jan. 10, 2018) https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2018/01/10/proposed-bans-on-ivory-sales-halted-by-interest-groups.

85. Jeff Asher & Mai Nguyen, *Gun Laws Stop at State Lines, But Guns Don't* (Oct. 26, 2017), https://fivethirtyeight.com/features/gun-laws-stop-at-state-lines-but-guns-dont.

86. *Id.*

87. *Id.*

88. Fobar, *supra* note 35.

89. Brittany Martin, *Shark Fins Were Banned in California in 2013. So Why are 60 Tons Still Entering the Port of L.A. Each Year?* (Mar. 8, 2017), https://www.timeout.com/los-angeles/blog/shark-fins-were-banned-in-california-in-2013-so-why-are-60-tons-still-entering-the-port-of-l-a-each-year-030817.

Thus, additional protections from states have not been able to extinguish the shark fin trade within the U.S.

V. SOLUTIONS

Since the Shark Conservation Act of 2010, Congress has made several attempts at enacting additional legislation protecting sharks and their relatives. The two most recent bills are H.R. 737, the Shark Fin Sales Elimination Act of 2019, and H.R. 788, the Sustainable Shark Fisheries and Trade Act of 2019.[90]

A. The Shark Fin Sales Elimination Act of 2019

On January 23, 2019, the Shark Fin Sales Elimination Act of 2019 was introduced in the House of Representatives. The stated purpose of this bill is to "prohibit the sale of shark fins."[91] This bill provides that "no person shall possess, offer for sale, sell, or purchase any shark fin or product containing any shark fin."[92] There are two exemptions to this prohibition. The first exemption is for traditional fisheries, education, and science.[93] The second is for dogfish fisheries.[94]

The first exemption for traditional fisheries, education, and science demands that "the shark fin is separated from the shark in a manner consistent with the license or permit" and satisfies one of four requirements.[95] First, the fin may be either be "destroyed or discarded upon separation."[96] Second, the fin may be "used for noncommercial subsistence purposes in accordance with State or territorial law."[97] Third, the fin may be "used solely for display or research purposes by a museum, college, or university, or by any other person under a State or Federal permit to conduct noncommercial scientific research."[98] Or fourth, the fin may be "retained by the license or permit holder for a noncommercial purpose."[99]

The second exemption provides that it "shall not be a violation . . . for any person to possess, offer for sale, sell, or purchase any fresh or frozen raw fin or tail from any stock of the species Mustelus canis (smooth dogfish) or

90. H.R. 737, 116th Cong. (2019); H.R. 788, 116th Cong. § 2 (2019).
91. *Id.*
92. *Id.* § 2.
93. *Id.* § 3.
94. *Id.* § 4.
95. *Id.* § 3.
96. *Id.* § 3(1).
97. *Id.* § 3(2).
98. *Id.* § 3(3).
99. *Id.* § 3(4).

Squalus acanthias (spiny dogfish)."[100] As with the Shark Conservation Act, the second exemption aims to support sustainable dogfish fisheries in the Atlantic. The continuation of this exemption will be evaluated by January 1, 2027.[101]

The Shark Fins Sales Elimination Act attempts to create an outright prohibition on shark fin products within the U.S., with two exemptions. The first exemption for traditional fisheries, education, and science is relatively minor. Traditional fisheries are relatively small, and it seems unlikely that egregious abuse of the education and science exemptions would be permitted. However, as explained below, the second exemption for smooth or spiny dogfish fins is more significant, and potentially problematic. At the time of writing, the Shark Fin Sales Elimination Act passed in the House of Representatives.

B. The Sustainable Shark Fisheries and Trade Act of 2019

On February 7, 2019, Rep. Daniel Webster introduced the Sustainable Shark Fisheries and Trade Act of 2019 into the House of Representatives. The stated purpose of the Act is to

> establish a certification process to ensure that foreign nations engaging in shark trade into or through the United States conserve and manage populations of sharks in a manner that is comparable to regulatory programs in the United States and that effectively prohibits the practice of removing shark fins and discarding the carcass at sea.[102]

The bill provides six criteria required for other nations' regulatory programs to become certified.[103] First, the programs must be consistent with the national standards for fishery conservation provided in the MSA.[104] Second, programs must regularly update management plans and use scientifically established catch limits and bycatch assessments and minimizations.[105] Third, programs must include a program to prevent overfishing and rebuild overfished stocks.[106] Fourth, programs must require reporting and data

100. *Id.* § 4(a).
101. *Id.* § 4(b).
102. H.R. 788, 116th Cong. § 2 (2019).
103. *Id.* § 3(5)(C).
104. *Id.* § 3(5)(C)(i).
105. *Id.* § 3(5)(C)(ii).
106. *Id.* § 3(5)(C)(iii).

collection.[107] Fifth, programs must be consistent with the International Plan of Action for Conservation and Management of Sharks of the United Nations Food and Agriculture Organization.[108] Sixth, programs must include a mechanism to ensure that, if the nation allows landings of sharks by foreign vessels that are not subject to such programs of such nation, only shark products that comply with such programs are exported to the U.S.[109]

This bill also proposes to amend the High Seas Driftnet Fishing Moratorium Protection Act. Specifically, it adds "to adopt shark conservation and management measures and measures to prevent shark finning, which are consistent with the International Plan of Action for Conservation and Management of Sharks of the Food and Agriculture Organization of the United Nations."[110]

This bill aims to promote sustainable shark, skate, and ray fisheries around the world by holding imports to the same standards as domestic fisheries. Consequently, the bill would promote shark conservation while also recognizing and rewarding the efforts of U.S. fisheries in reducing overexploitation. At the time of writing, the Sustainable Shark Fisheries and Trade Act is yet to pass the House of Representatives.

C. Comparative Analysis of Proposed Legislation

Considerable differences of opinion over these competing bills exist within the scientific and conservation communities.[111] For example, over 150 scientists wrote a letter to Congress in support of an earlier version of the Shark Fin Trade Elimination Act.[112] Meanwhile, other scientists helped to draft the Sustainable Shark Fisheries and Trade Act,[113] and 62 scientists signed a letter of support for the bill.[114] Reasonable scientific minds can

---

107. *Id.* § 3(5)(C)(iv).

108. *Id.* § 3(5)(C)(v).

109. *Id.* § 3(5)(C)(vi).

110. *Id.* § 4.

111. *See* Fobar, *supra* note 35 (discussing competing views among scientists over shark conservation); *compare Support Sustainable Shark Trade*, WILDLIFE CONSERVATION SOC'Y, https://secure.wcs.org/campaign/support-sustainable-shark-trade (last visited Feb. 2, 2020) (arguing for sustainable shark finning), *with Tell your Senators: Ban the Trade of Shark Fins in the U.S.*, https://act.oceana.org/page/40413/action/1?locale=en-US (last visited Feb. 7, 2020) (arguing for stopping shark finning).

112. Press Release, Oceana, Over 150 Scientists Call on Congress to Pass National Shark Fin Trade Ban (May 9, 2017), https://oceana.org/press-center/press-releases/over-150-scientists-call-congress-pass-national-shark-fin-trade-ban.

113. Fobar, *supra* note 35.

114. Robert E. Heuter & David S. Shiffman, *Rebuttal to "Response to 'A United States Shark Fin Ban Would Undermine Sustainable Shark Fisheries' I.F. Porcher et al., Marine Policy 104 (2019) 85-89,"* 110 MARINE POL'Y. 1, 3 (2019).

differ on the best approach to an issue, so ultimately neither letter alone provides compelling justification for why Congress should support one bill over the other.

The main purpose of each bill ostensibly is shark conservation, though they take different approaches towards this goal. For example, the definitions of "shark" in each bill differ. In the Shark Fin Sales Elimination Act, "shark" encompasses "any species of the orders Pristiophoriformes, Squatiniformes, Squaliformes, Hexanchiformes, Lamniformes, Carcharhiniformes, Orectolobiformes, and Heterodontiformes."[115] In the Sustainable Shark Fisheries and Trade Act, "shark" refers to "any species of the subclass Elasmobranchii."[116] This distinction is important; the first definition includes only sharks, while the second is broader and also includes skates and rays. In this regard, the Sustainable Shark Fisheries and Trade Act may benefit even more threatened species.[117]

The exemptions in the Shark Fin Sales Elimination Act are also potentially problematic. For instance, the exemption for traditional fisheries, education, and science undoubtedly is well-intended. Yet, similar exemptions in the context of whaling have proven to be extremely controversial.[118] Thorough reviews of these exemptions are necessary to avoid a repeat of those types of issues. However, the main issue with this bill is the exemption for dogfish fisheries. This exemption is troubling for two reasons. First, providing an exemption for two species that are purportedly sustainably fished in U.S. waters sends a mixed message. Dogfish populations fluctuate considerably, which calls into question the sustainability of the fishery.[119] Even assuming that dogfish fisheries are sustainable, it raises the question as to why other sustainable shark fisheries are not exempt. Second, allowing some shark fins to be possessed, sold, and ultimately consumed, creates confusion for consumers, the restaurant industry, and enforcement officers. Visual species identification of some shark fins is possible,[120] though it remains to be seen how effective it is in

115. H.R. 737, 116th Cong. § 6(1) (2019).

116. H.R. 788, 116th Cong. § 9(A) (2019).

117. Dulvy et al., *supra* note 19, at 5 (noting that 19.9% of skates and rays are threatened, and 47.5% are listed as data deficient.)

118. *See generally* Vassili Papastavrou & Patrick Ramage, *Commercial Whaling by Another Name. The Illegality of Japan's Scientific Whaling: Response to Dan Goodman*, 13 J. INT'L WILDLIFE L. & POL'Y 183 (2010) (arguing inadequacies of International Convention for the Regulation of Whaling).

119. *See generally* Ila France Porcher et al., *Response to "A United States Shark Fin Ban Would Undermine Sustainable Shark Fisheries" D.S. Shiffman & R.E. Hueter*, *Marine Pol'y 85 (2017) 138–140*, 85 MARINE POL'Y 104 (2019) (using the fluxes in dogfish populations to illustrate concerns with a shark fin fishery).

120. *See generally* DEBRA L. ABERCROMBIE ET AL., NAT'L OCEANIC & ATMOSPHERIC ADMIN., VISUAL IDENTIFICATION OF FINS FROM COMMON ELASMOBRANCHS IN THE NORTHWEST ATLANTIC OCEAN (2013) (discussing visual identification of shark fins).

practice. Generally, the only way to identify species once fins have been dried is through DNA testing.[121] DNA testing can be time consuming and expensive,[122] although recent developments may increase the accuracy and portability of these tests.[123] Nonetheless, the average individual consumer will have no way of knowing whether the fins they are purchasing come from sustainable or unsustainable sources.

The Sustainable Shark Fisheries and Trade Act of 2019 is not without its own issues. Promoting sustainable shark fisheries around the world certainly is a worthwhile goal. Yet this Act has a clear anthropocentric approach (i.e., primarily intended to benefit humans) compared with the more biocentric approach of the Sharks Fin Sales Elimination Act. Additionally, with the U.S. market for shark fins remaining relatively small, it is unclear what effect this bill would actually have on international fisheries. If most of the demand for shark fins remains in Asia, there appears to be little incentive for other nations to actively ensure their fisheries comply with this particular U.S. law. Further, permitting any trade in shark fins still enables the practice of shark finning to continue. For instance, shark finning is banned in the United Kingdom (and throughout the European Union), yet shark fins are still found in restaurants there.[124]

The Sustainable Shark Fisheries and Trade Act also relies on the process of certifying nations that have "adopted and effectively enforce[] regulatory programs to provide for the conservation and management of sharks, and measures to prohibit shark finning, that are comparable to those of the United States."[125] Certification is a laudable goal, but history shows that the idea of certification does not always accord with conservation. First, certification is extremely susceptible to political whims, because it relies on the discretion of various departments of government before ultimately leaving the final decision to the President. Second, certification permits other diplomatic concerns to be prioritized above conservation goals. For example, the Pelly Amendment to the Fishermen's Protective Act of 1967 required the Secretary of Commerce to certify foreign countries that were acting to diminish the effectiveness of international fishery conservation programs.[126] However, in

---

121. *Id.* at 2.

122. *Id.* at 2.

123. *See generally* Shalili Johri et al., *Genome Skimming With the MinION Hand-held Sequencer Identifies CITES-listed Shark Species in India's Exports Market*, 9 SCI. REP. 1 (2019) (describing the accuracy of a portable DNA-sequencing device).

124. Dehghan, *supra* note 82.

125. H.R. 788, 116th Cong. § 3(2)(A) (2019).

126. Fishermen's Protective Act of 1967, 22 U.S.C. §§ 1971–1979, *amended by* Pub. L. No. 92-219, 85 Stat. 786 (1971) (amending the Act to enhance the effectiveness of international fishery conservation programs).

the first five instances of certification, the President declined to apply any sanctions.[127] More recently, even with clear findings that Iceland's whaling industry had diminished the effectiveness of the Convention on International Trade in Endangered Species, the U.S. declined to apply sanctions.[128] Although certification under the Pelly Amendment differs from the provisions in the Sustainable Shark Fisheries and Trade Act, these examples highlight the inherent challenges with certification and international diplomacy. Finally, given the range of countries involved in harvesting and processing shark fins, deciding which nations to deny certification to would be extremely challenging.

D. Potential Alternatives to Proposed Legislation

Congress may yet decide to pass one of the two shark conservation bills before them, and either of these bills would improve the status quo. Ideally, however, the U.S. should lead by example and ban shark fin sales, echoing its response to the marine mammal crisis of the 1960s and 1970s.[129] The circumstances leading to the enactment of the Marine Mammal Protection Act of 1972 (MMPA) are analogous to the current situation with sharks.[130] In the 1960s and 1970s there was growing domestic and international outcry over marine mammal declines resulting from overexploitation and bycatch.[131] Additionally, the MMPA's legislative history indicates concern amongst representatives over the effects of inconsistent state laws.[132]

The MMPA generally prohibits the "take"[133] of any marine mammals in U.S. waters and by U.S. citizens on the high seas, with limited exceptions for Alaska natives, scientific research, public display, educational purposes, and

---

127. Japan Whaling Ass'n v. American Cetacean Soc., 478 U.S. 221, 225 (1986).

128. The White House Office of the Press Secretary, Message to the Congress – Iceland and the Fisherman's Protective Act (Apr. 1, 2014), https://obamawhitehouse.archives.gov/the-press-office/2014/04/01/message-congress-iceland-and-fisherman-s-protective-act.

129. *See generally Marine Animals and the Marine Mammal Protection Act*, https://www.marinemammalcenter.org/what-we-do/rescue/marine-mammal-protection-act.html (last visited Mar. 17, 2020) (explaining the role of the Marine Mammal Protection Act post-enactment); *see also* NAT. RES. DEF. COUNCIL, NET LOSS: THE KILLING OF MARINE MAMMALS IN FOREIGN FISHERIES 9–13 (2014) (describing U.S. efforts to reduce marine mammal bycatch in response to global fisheries crisis).

130. Marine Mammal Protection Act of 1972, 16 U.S.C. §§ 1361–1423h (2018); *Marine Mammals and Fish*, NAT'L. ANTI-VIVISECTION SOC'Y, https://www.navs.org/what-we-do/keep-you-informed/legal-arena/wildlife/marine-mammals/#.XnEq8C2ZMRY (last visited Mar. 17, 2020).

131. *Marine Animals and the Marine Mammal Protection Act*, *supra* note 129; *see generally* Wade et al., *Killer Whale and Marine Mammal Trends*, 23 MARINE MAMMAL SCI. 766 (2007) (examining the effect of sequential megafauna collapse of whale catches in the late 1960s and harbor and fur seals in the 1970s).

132. H.R. REP. NO. 92-707, as reprinted in 1972 U.S.C.C.A.N. 4144, 4149.

133. Under the MMPA, "take" is defined as to "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." 16 U.S.C. § 1362(13) (2018).

other provisions applying to specimens taken or agreements entered into prior to 1972.[134] Thus, the MMPA allows little room for compromise for the direct take of marine mammals—there are no provisions allowing the selective harvest of different marine mammal body parts. To further ensure the conservation of marine mammals, the MMPA also requires NOAA and the U.S. Fish and Wildlife Service to conduct annual stock assessments of species covered under the act.[135]

The U.S. has since used the MMPA to further international conservation of marine mammals, even though there is little demand for marine mammal products in the United States. Clearly, some issues remain with international marine mammal conservation, but the MMPA undoubtedly has been successful at restoring and conserving populations of imperiled marine mammals.[136] The MMPA even received wide support from both Democrats and Republicans at the time of its passage.[137] Bipartisan support for environmental legislation may be more difficult to achieve in the current political climate, so an MMPA equivalent for sharks is unlikely. However, at the time of writing, the Shark Fin Sales Elimination Act has 287 co-sponsors (219 Democrats and 68 Republicans), a far greater number than the Sustainable Shark Fisheries and Trade Act.[138]

Sharks and marine mammals also have obvious differences in their biology and ecology. Sharks and other elasmobranchs are far more diverse than marine mammals.[139] Many also have much more cryptic life-histories than marine mammals,[140] making it more challenging to conduct accurate population assessments.[141] Nonetheless, some of the fundamental MMPA provisions could still be adapted to protect elasmobranchs.

---

134. *Id.* § 1374(c) (exempting taking of marine mammals for scientific research, education, and other purposes); *id.* § 1388(c) (discussing the MMPA's effect on jurisdiction over fish and wildlife resources for Alaska Natives); *id*. § 1372(e) (discussing the MMPA's retroactive effect).

135. *Id.* § 1386.

136. *See generally* Joe Roman et al., *The Marine Mammal Protection Act at 40: Status, Recovery, and Future of U.S. Marine Mammals*, 1286 ANNALS N.Y. ACAD. SCI. 29, 29 (2013) (discussing the MMPA's effectiveness in meeting its purposes).

137. H.R. Rep. No. 92-707 (House Vote No. 362 in 1972 and Senate Vote No. 716 in 1972).

138. H.R. 788, 116th Cong. (1st Sess. 2019); H.R. 737, 116th Cong. (1st Sess. 2019).

139. *Compare* Sandra Pompa, et al., *Global Distribution and Conservation Marine Mammals*, 108 PROC. NAT'L ACAD. SCI. U.S. 13600, 13600, 13601 (2011) (stating there are 129 marine mammal species), *with Chondrichthyes—Rays, Sharks, Skates, Chimaeras*, WILDLIFE J. JUNIOR, https://nhpbs.org/wild/chondrichthyes.asp (stating there are over 1,000 species of elasmobranchii).

140. *See generally* Oliver J. D. Jewell et al., *Cryptic Habitat Use of White Sharks in Kelp Forest Revealed by Animal-Borne Video*, BIOLOGY LETTERS, Apr. 2019 (discussing newly observed cryptic behavior of white sharks in kelp forests).

141. *See generally* Douglas J. McCauley et al., *Evaluating the Performance of Methods for Estimating the Abundance of Rapidly Declining Coastal Shark Populations*, 22 ECOLOGICAL APPLICATIONS 385 (2012) (evaluating the effectiveness of survey tools and the difficulty of obtaining accurate population surveys).

VI. SHARK FIN BANS

A. Counterarguments

Here, I address common counterarguments to banning the possession and sale of shark fins, given that many state, and some federal, laws target this trade. Few argue against the ethical reasons for banning the shark fin trade, but three prominent counterarguments have been put forth. First, there are fears over the potentially negative effects on sustainable fisheries. Second, some argue that the bans are culturally biased. Third, there are concerns that a U.S. ban will have little effect on shark conservation given the relative insignificance of the U.S. shark fin market.

1. Negative Effects on Sustainable Fisheries

Perhaps the biggest criticism of an outright U.S. ban on possession of shark fins is that it would harm purportedly sustainable domestic fisheries. Shark finning is already banned in U.S. waters, and not all shark fins are sourced from finned animals.[142] In many instances, whole animals are caught and landed, with the fins removed after death.[143]

Shark fisheries in the U.S. generally are managed more sustainably than many countries thanks to legislation, such as the MSA. For example, of some 16 stocks reported to be sustainably managed, nine involve U.S. fishermen.[144] Further, different consumer seafood guides identify several U.S. shark fisheries as sustainable.[145] A complete ban would remove that management model from the market, possibly removing incentives for other nations to adopt that model.[146] Notably, however, stocks of blue sharks (the species most commonly caught for their fins) in the North Atlantic are not sustainably managed.[147]

---

142. *See Understanding Atlantic Shark Fishing* (June 18, 2019), https://www.fisheries.noaa.gov/insight/understanding-atlantic-shark-fishing (discussing shark fishing industry).

143. *See id.* (noting that sharks must be landed with fins attached).

144. D.S. Shiffman & R.E. Hueter, *A United States Shark Fin Ban Would Undermine Sustainable Shark Fisheries*, 85 MARINE POL'Y 138, 138 (2017).

145. *Id.* at 139. Of the ten shark stocks (from six species) included in the study, five were rated as sustainable by two of NOAA FishWatch, the Marine Stewardship Council, or Seafood Watch. However, none were rated as sustainable by all three consumer seafood guides.

146. *Id*.

147. Simpfendorfer & Dulvy, *supra* note 45, at R98.

Aside from fins, the other main component of sustainable shark fisheries is shark meat.[148] The largest producers of shark meat are Spain and Taiwan, with Korea, Italy, and Brazil also making the list of major importers of the product.[149] The U.S. is the eighth largest exporter of shark meat, producing an average of 3,861 metric tons per year between 2000 and 2011.[150] Consequently, a U.S. shark fin ban may also harm law-abiding fishermen by reducing the value of sharks initially landed for meat.[151]

The growing demand for shark meat is likely related to the increased application of "fin-attached" regulations around the world.[152] It also further highlights how the demand for the more valuable shark fins drives shark fisheries. Thus, the Shark Fin Sales Elimination Act may ultimately be more beneficial for sustainable fisheries by providing firm leadership and guidelines in the shark conservation crisis.[153] Moreover, there is no direct evidence to suggest that an outright ban would harm sustainable fisheries.[154] Identifying what levels of fishing are sustainable is also challenging because of the massive data deficiencies existing for many shark populations.[155] Given the high levels of mercury found in shark meat,[156] it is also unclear how much demand will continue to increase as detrimental health effects become more apparent. Therefore, a U.S. ban on possessing shark fins may not actually negatively affect purportedly sustainable fisheries.

2. Perceived Cultural Bias

Arguably the most controversial aspect of shark fin bans is that some perceive them as being biased against Asian Americans, particularly those with Chinese heritage. One of the initial challenges to California's Shark Fin Law claimed that it violated the Equal Protection Clause by preventing Chinese Californians from practicing cultural traditions.[157] The Northern District of California examined the legislative history of the law, finding that sharks are important for ecosystem heath; shark finning causes millions of

148. VALLIANOS ET AL., *supra* note 27, at 16.

149. Felix Dent & Shelley Clarke, *State of the Global Market for Shark Products*, 93–96, U.N. Food & Agric. Org. Fisheries & Aquaculture Technical Paper No. 590 (2015).

150. *Id.* at 93.

151. *Id*. at 138; *Shark Fin Sale Bans Would Hurt U.S. Fisherman Without Improving Shark Conservation,* https://www.fisheries.noaa.gov/leadership-message/shark-fin-sale-bans-would-hurt-us-fishermen-without-improving-shark-conservation (last visited Mar. 18, 2020).

152. VALLIANOS ET AL., *supra* note 27, at 16.

153. Porcher, *supra* note 119.

154. *Id.*

155. *Id.*

156. Elevated levels of mercury and other toxins have also been found in shark fins. VALLIANOS ET AL., *supra* note 27, at 18.

157. Chinatown Neighborhood Ass'n v. Harris, 33 F.Supp.3d 1085, 1090 (N.D. Cal. 2014).

sharks to die each year; and the market for shark fins in California contributes to the declines in shark populations.[158] That court was not convinced by the Equal Protection claim, holding that the law was facially neutral and finding that there were no facts showing the law was enacted for the purpose of discriminating against Chinese Californians.[159]

Given the history of shark fin soup consumption, many of those most affected by the ban would indeed be Chinese Americans. Notably, however, the California law had the support of several Chinese American politicians and the Asian Pacific American Ocean Harmony Alliance group.[160] Similarly, conservation groups have sought to involve groups of affected citizens in campaigns to raise awareness of the impacts of the shark fin trade on worldwide populations of these animals. For instance, WildAid has recruited several Chinese celebrities to serve as ambassadors for its shark fin campaigns in China.[161]

The shark fin trade truly is global.[162] Spanish and Indonesian fishing vessels are heavily involved in catching sharks throughout the world's oceans.[163] Fins and carcasses are then processed in countries such as China and Japan.[164] Outside of China, many fins are exported for consumption in Singapore, Malaysia, and Vietnam.[165] Thus, a nationwide shark fin ban may indirectly affect numerous other countries rather than targeting one specific community in the United States. The issues with shark fin bans in California and elsewhere also highlight the importance of developing legislation with the communities most affected by them.

3. Relative Insignificance of the U.S. Shark Fin Market

Some argue that eliminating the U.S. as a market for shark fins would have a negligible effect on shark conservation worldwide. Certainly, the U.S. is a relatively minor importer of shark fins,[166] and the market for shark fins is greatest in Asia.[167] However, the U.S. shark fin exports are moderately

158. *Id.* at 1091.
159. *Id.* at 1095; *see also* Chinatown Neighborhood Ass'n v. Brown, 539 Fed. App'x 761, 762 (9th Cir. 2013) (reviewing Chinatown's other claims of error, finding none).
160. Eilperin, *supra* note 28.
161. *Sharks*, https://wildaid.org/programs/sharks/ (last visited Feb. 7, 2020).
162. Dent & Clarke, *supra* note 149, at 2.
163. *Id.* at 3.
164. *Id.*
165. *Id.*
166. *Id.* at 85.
167. *Id.* at 3.

more significant.[168] Most of these exports are destined for Hong Kong and mainland China.[169]

Recent evidence suggests that the market for shark fins in China may be declining, perhaps resulting from shark finning awareness campaigns organized by conservation groups.[170] For instance, one estimate suggests that shark fin soup consumption in China fell by over 80% in the past decade.[171] However, global demand for shark fins remains fairly consistent.[172] As the market declines on the Chinese mainland, it is expanding in Hong Kong, Macau, and Thailand.[173] Thus, even with a reduction in demand for shark fins in China, the U.S. market for them will likely remain relatively minor.

Clearly, removing the U.S. as an importer or exporter of shark fins will have relatively little direct impact on the global market.[174] Nonetheless, the indirect effects could be substantial. A number of other countries and jurisdictions have already banned commercial shark fishing and the sale or trade of shark products.[175] If the U.S. enacted an outright ban on shark fin products, it would send a powerful message throughout the world, regardless of the relatively small direct effect the ban may have on international markets. A nationwide shark fin ban would further stigmatize shark finning, which should help to reduce demand. As with other animal products such as ivory, reducing demand is the key for long-term conservation.

B. Implications for International Trade

A federal ban on the import and export of shark fins could encounter issues with World Trade Organization (WTO) policies or principles the WTO incorporated from the General Agreement on Tariffs and Trade (GATT).[176] The general rule under the GATT is that nations cannot discriminate against other nations in trading goods.[177] The WTO Appellate Body resolves disputes arising under the GATT, and established a two-tiered analysis for whether a particular domestic law that violates the GATT fits within an

168. *Id.* at 85.

169. *Id.*

170. In 2013 the Chinese government commendably banned the use of shark fins in dishes served at official banquets. VALLIANOS ET AL., *supra* note 27, at 4.

171. *Id.* at 7.

172. Dent & Clarke, *supra* note 149, at 19.

173. VILLIANOS ET AL., *supra* note 27, at 7–15.

174. The U.S. shark fin export market is responsible for around one percent of global volume by weight. Dent & Clarke, *supra* note 149, at 85.

175. *International Shark Finning Bans and Policies*, ANIMAL WELFARE INST., https://awionline.org/content/international-shark-finning-bans-and-policies (last visited June 15, 2019).

176. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT].

177. *Id.* at art. I.

exception.[178] The first step determines if the measure can be justified under the alphabetized exceptions in GATT Article XX.[179] These exceptions provide for, inter alia, measures "necessary to protect public morals," "necessary to protect human, animal or plant life or health," and "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption."[180] The second step determines whether the measure constitutes a means of "arbitrary or unjustifiable discrimination between countries where the same conditions prevail", or is "a disguised restriction on international trade."[181]

Relevant environmental cases heard before the WTO Appellate Body include DS-21 ("*Tuna/Dolphin*"), DS-58 ("*Shrimp/Turtle*"), and DS-400 and 401 ("*EC/Seal Products*"). *Tuna/Dolphin* considered labeling of tuna products in the U.S. based on the requirements of the Dolphin Protection Consumer Information Act.[182] Tuna caught using proper methods could be labelled as "Dolphin Safe."[183] Mexico challenged this regulation,[184] however, and it has been extensively litigated since the early 1990s.[185] The first WTO Appellate Body report focused on interpreting the meaning of "necessary" in the Article XX exceptions, and determined that it required a nation to "exhaust[] all options possibly available to it" in pursuit of an objective under one of those exceptions.[186]

Shrimp/Turtle involved a dispute between the U.S. and India, Malaysia, Pakistan, and Thailand over restrictions on shrimp imports into the U.S.[187] The U.S. imposed regulations requiring shrimp fisheries to use turtle-excluder devices,[188] which the complainants claimed was discriminatory.[189] The WTO Appellate Body agreed with the complainants and found that the U.S. measure arbitrarily and unjustifiably discriminated between WTO

178. Appellate Body Report, *United States—Standards for Reformulated and Conventional Gasoline*, 22, WTO Doc. WT/DS2/AB/R (adopted Apr. 29, 1996).

179. GATT, *supra* note 176, at art. XX.

180. GATT, *supra* note 176, at art. XX(a), (b), & (g).

181. Appellate Body Report, *supra* note 178, at 13.

182. Panel Report, *United States—Restrictions on Imports of Tuna*, DS21/R - 39S/155 (adopted Sept. 3, 1991).

183. *Id.* at 5.

184. *Id.* at 40.

185. Colin Dwyer, *U.S. Gets a Big Win in its Long Fight with Mexico Over 'Dolphin Safe' Labels* (Dec. 14, 2018), https://www.npr.org/2018/12/14/676760611/u-s-gets-a-big-win-in-its-long-fight-with-mexico-over-dolphin-safe-labels.

186. Panel Report, *supra* note 182, at 37.

187. Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc. WT/DS58/AB/R (adopted Oct. 12, 1998).

188. *Id.* at 2–4.

189. *Id.* at 1.

Members, violating the Article XX chapeau.[190] Importantly, however, the WTO Appellate Body did at least find that the regulation satisfied the Article XX(g) exception for being related to the conservation of exhaustible natural resources.[191]

Most recently, in DS-400 and DS-401 ("*EC/Seal Products*"), the European Union (EU) sought to prohibit the import and sale of processed and unprocessed seal products, with exceptions for indigenous communities and seal products harvested during the course of marine resource management.[192] Norway and Canada challenged the EU's regulation.[193] There, the WTO Appellate Body determined that the measure satisfied the Article XX(a) exception for being necessary to protect public morals.[194] However, it found that the EU failed to justify the indigenous communities' exception under the Article XX chapeau.[195] Together, these cases have implications for both shark conservation bills before Congress.

Issues relating to general shark fin bans and the WTO/GATT have been thoroughly analyzed before.[196] Consequently, here I specifically assess potential WTO/GATT implications for both shark conservation bills currently before Congress. There is no explicit reference to the import or export of shark fins in the Shark Fin Sales Elimination Act. Thus, the general prohibition that "no person shall possess, offer for sale, sell, or purchase any shark fin or product containing any shark fin,"[197] is unlikely to be challenged under the GATT. However, although the smooth and spiny dogfish exemption does not explicitly mention U.S. fisheries, it is implicitly permitting trade in shark fins from predominantly U.S. fisheries. Therefore, the WTO Appellate Body may find that this provision constitutes a "disguised restriction on international trade."[198] Similarly, the WTO Appellate Body may take issue with the exemption for "noncommercial subsistence purposes," given the similarity with the indigenous communities' exemption it found problematic in *EC/Seal Products*. The federal government's best defense here may be to argue that the Article XX(b) and (g) exceptions apply.[199] Or, alternatively, the exemptions should simply be

190. *Id.* at 75.

191. *Id.* at 75.

192. Appellate Body Report, *European Communities—Measures Prohibiting the Importation and Marketing of Seal Products*, WTO Docs. WT/DS400/AB/R & WT/DS401/AB/R (adopted May 22, 2014).

193. *Id.* at 13.

194. *Id.* at 146–50.

195. *Id.* at 132–46.

196. *See* Elizabeth Neville, *Shark Finning: A Ban to Change the Tide of Extinction*, 25 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 387, 404–15 (2014) (concluding that a nationwide ban on shark fins would minimize potential WTO violations).

197. H.R. 737, 116th Cong. § 2(a) (2019).

198. Appellate Body Report, *supra* note 178, at 13.

199. In other words, that the shark fin ban would be necessary to protect public morals, and that sharks are an exhaustible natural resource.

removed from the Shark Fin Sales Elimination Act. Overall, the risk to this shark fin ban from litigation under the GATT is low.

The Sustainable Shark Fisheries and Trade Act could also be challenged under the GATT for being discriminatory and unduly burdensome on other nations, as it seeks to ensure they adopt shark fishing regulatory schemes similar to those in the United States. In fact, this bill would be more likely to violate the GATT because of its explicit reference to the import of shark products. These provisions may violate the "most favoured nation" treatment under Article I of the GATT, and therefore the Sustainable Shark Fisheries and Trade Act is a relatively riskier bill.

VI. CONCLUSIONS

Cooperative federalism has failed to sufficiently protect shark populations. The current assortment of state laws provides exactly the kind of "whack-a-mole" effect conservationists tried to avoid. Stronger, unified federal law is necessary to protect shark populations in the U.S. and internationally. Current state laws banning the shark fin trade serve only to shift the trade to other states lacking protections. Additionally, even in those states where shark fin prohibitions exist, much of the shark fin trade appears to have gone underground.[200] For example, evidence suggests that shark fin soup is still available at restaurants in ten of the twelve states with bans.[201] By enacting a shark fin ban at the federal level, greater resources likely would be available for authorities to enforce the law. A federal ban would also be easier to enforce than continuously checking imported fins to ensure that they are from sustainable sources.

Of the two bills currently before Congress, the Shark Fin Sales Elimination Act of 2019 represents the more effective option for long-term shark protection. An outright prohibition on shark fin possession would be the cleanest and most effective way to prevent cruelty and promote conservation. The dogfish fisheries exemption in the Shark Fin Sales Elimination Act remains problematic but could be improved by reevaluating the fisheries before 2027. The ideal legislation would be similar to the MMPA and involve a prohibition on the taking of sharks, unless the population or species is certified as sustainable by NOAA. Several countries and jurisdictions already have enacted similar laws.[202]

Most recently, Canada enacted its own ban on the import and export of shark fins. In so doing, Canada became the first G7 and G20 country to ban

200. Fobar, *supra* note 35.
201. *Id.*
202. *International Shark Finning Bans and Policies*, *supra* note 175.

shark fins.[203] Canada has banned the act of shark finning in Canadian waters since the early 1990s. However, Canada remained one of the most significant importers of shark fins outside of Asia.[204] Canadian efforts to ban shark fins were spearheaded by Asian-Canadians, yet efforts still encountered criticism over their alleged cultural discrimination.[205] These concerns led to a shark fin ban enacted by the city of Toronto being struck down in court in 2012.[206] Undeterred, lawmakers and advocates persisted with their campaign to ban the import and export of shark fins in Canada, and bill C-68 was passed in June 2019.[207] Canada's example is one that the U.S. can and should follow. Although the direct effect of a U.S. ban on sharks caught for finning would be minor, the indirect effects of another G7 and G20 nation banning shark fins would be substantial.

An extensive discussion of international laws covering sharks and their relatives is beyond the scope of this note. A shark fin ban will not solve the conservation crisis threatening these animals. Plenty of other challenges, such as addressing bycatch issues worldwide, will remain.[208] Shark fin markets in Asia are largely out of U.S. control, and ultimately for such widespread and often high migratory animals, improved international law is crucial. Without international cooperation, we will likely witness the same domestic "whack-a-mole" situation except on a larger scale.[209] Eventually, significant international cooperation will be required to address finning, bycatch, and habitat loss given that many sharks are highly migratory species.[210] Nonetheless, a U.S. ban will represent a significant step towards more effective shark conservation and will send a clear message to the rest of the world. A ban would also address the ethical problems with the procurement of many shark fins.

---

203. Leyland Cecco, *Canada Becomes First G7 Country to Ban Shark Fin Imports* (June 21, 2019), https://www.theguardian.com/world/2019/jun/21/canada-bans-shark-fin-imports-sale.

204. Dent & Clarke, *supra* note 149, at 21.

205. Cecco, *supra* note 203.

206. Micah Luxen, *Toronto Councillors Outraged After Shark Fin Ban Struck Down* (Dec. 2, 2012), https://www.thestar.com/news/gta/2012/12/02/toronto_councillors_outraged_after_shark_fin_ban_struck_down.html.

207. An Act to Amend the Fisheries Act and Other Acts in Consequence, S.C. 2019, c 14 (Can.).

208. Simpfendorfer & Dulvy, *supra* note 45, at R98.

209. Boris Worm et al., *Global Catches, Exploitation Rates, and Rebuilding Options for Sharks*, 40 MARINE POL'Y 194, 201 (2013).

210. *See* Crystal Green, *An International SOS (Save Our Sharks): How the International Legal Framework Should Be Used to Save Our Sharks*, 27 PACE INT'L L. REV. 701, 711 (2015) (discussing special considerations, including sharks' migratory nature, needing consideration); James Kraska & Lindsay Gaskins, *Can Sharks Be Saved? A Global Plan of Action for Shark Conservation in the Regime of the Convention on Migratory Species*, 5 SEATTLE J. ENVTL. L. 415, 417 (2015) (discussing importance of sharks' migratory nature).

Some authors claim that the Shark Fin Sales Elimination Act is misguided, and paint supporters of a U.S. shark fin ban as having been convinced by "simplified global overviews."[211] However, a comparatively simple measure does not indicate a lack of understanding about the complexities of the problem. A federal shark fin ban is merely one step towards alleviating the extinction crisis facing sharks. This will reaffirm Congressional intent to recognize the inherent value of sharks to ecosystems and ensure their long-term conservation. These same authors also underestimate the value of legislative history compared to peer review when criticizing arguments in support of the Shark Fin Sales Elimination Act. [212] There is no reason to think that a few anonymous reviews by scientific colleagues is a more rigorous process than documented Congressional hearings on an issue. Indeed, courts can use legislative history as an important tool of statutory construction.[213]

The advantages stemming from a shark fin ban transcend cultural and geographic borders. Shark ecotourism is a rapidly growing industry,[214] and there are considerable ecosystem benefits from more abundant shark populations.[215] Unfortunately, we live in an age of almost endless challenges in both the ethical treatment of animals and wildlife conservation. There are numerous examples of societies opposing animal cruelty and promoting wildlife conservation despite the sometimes-negative effects on certain communities and cultures. [216] Societal progress on these types of issues ultimately requires all of us to make certain sacrifices.

Sharks have existed for close to half a billion years. At current rates of overexploitation, many sharks do not have another half a billion years to wait for the federal government to enact effective legislation protecting them. Shark finning and other threats mean that some species could become extinct within a few decades. Addressing these challenges requires the U.S. Congress to be bold and to once again take the lead on conservation of threatened marine species.

---

211. Heuter & Shiffman, *supra* note 114, at 13601.

212. *See generally id.* (relying on peer review rather than legislative history).

213. *See generally, e.g.*, Corning Glass Works v. Brennan, 417 U.S. 188 (1974) (considering legislative history in defining statutory term); Train v. Colo. Pub. Interest Research Grp., Inc., 426 U.S. 1 (1976) (holding that it was error for lower court to exclude reference to legislative history in determining meaning of statute); Blanchard v. Bergeron, 489 U.S. 87 (1989) (using legislative history in statutory interpretation).

214. Mustain, *supra* note 8, at 6.

215. *Id.* at 5.

216. A few examples include opposition to the cruel treatment of chickens, cows, and pigs in factory farms; bullfighting; fox hunting; the destruction of orangutan habitat for palm oil plantations; and the slaughter of elephants and rhinoceros for ivory.

SIERRA CLUB V. VIRGINIA ELECTRIC & POWER CO.: HOW A CLEAN WATER ACT MISINTERPRETATION MAY OPEN THE FLOODGATES TO FUTURE GROUNDWATER POLLUTERS

Therese Wilkerson

Author's Note

This Note was written in fall of 2018 while the U.S. Environmental Protection Agency's (EPA) "Waters of the United States" (WOTUS) rule was still in effect. Since the Note was accepted for publication, the EPA and the Department of the Army repealed and replaced the WOTUS rule with the "Navigable Waters Protection Rule" on January 23, 2020, which will, in part, categorically exclude groundwater from the scope of the Clean Water Act.[1] *As of the date of this Note's publication, the Navigable Waters Protection Rule has not yet been published in the Federal Register and will only take effect 60 days after publication in the Federal Register. While the WOTUS rule will soon no longer be in effect, the Note's analysis according to Fourth Circuit precedent and the EPA rule in effect at the time the Fourth Circuit decided Sierra Club v. Virginia Electric & Power Co. may prove useful for citizens or environmental groups seeking to challenge the adequacy of the Navigable Waters Protection Rule. As such, "the new [Navigable Waters Protection Rule] hardly represents the final word on what qualifies as a jurisdictional 'water of the United States.' . . . Lawsuits challenging the 2019 repeal rule and the 2015 Clean Water Rule are both ongoing."*[2] *For example, the Senior Attorney Blanding Holman of the Southern Environmental Law Center (SELC) has stated that should EPA*

1. *The Navigable Waters Protection Rule: Definition of "Waters of the United States" Pre-publication Notice* (Jan. 23, 2020), https://www.epa.gov/sites/production/files/2020-01/documents/navigable_waters_protection_rule_prepbulication.pdf.

2. Marc Bruner et al., *Trump Navigable Waters Rule Bound for Court Challenges* (Jan. 30, 2020), https://www.law360.com/articles/1238927/trump-navigable-waters-rule-bound-for-court-challenges.

finalize the repeal of the 2015 WOTUS rule, the SELC "plan[s] to fight [the EPA and the Department of the Army] with everything [they] have to protect our communities and clean water."[3] *Most notably, a suite of environmental organizations has already filed a notice of intent to sue the EPA for its "2020 Revised Regulatory Definition of 'Waters of the United States'" rule.*[4]

3. *EPA Announces Move to Strip Clean Water Act Protections*, S. ENVTL. L. CTR., https://www.southernenvironment.org/news-and-press/news-feed/white-house-announces-move-to-strip-clean-water-act-protections (last visited Mar. 24, 2020).

4. CTR. FOR BIOLOGICAL DIVERSITY ET AL., FORMAL NOTICE OF INTENT TO SUE FOR VIOLATION OF THE ENDANGERED SPECIES ACT; 2020 REVISED REGULATORY DEFINITION OF "WATER OF THE UNITED STATES" (Jan. 13, 2020).

INTRODUCTION

On September 12, 2018, the United States Court of Appeals for the Fourth Circuit issued a judgment that added another untenable wrinkle in the fabric of groundwater pollution regulation.[5] Since Congress enacted the Federal Water Pollution Control Act (Clean Water Act), federal circuit courts have contemplated the issue of whether groundwater pollution falls under the "navigable water" provision of the Clean Water Act's (CWA)[6]—albeit without tenable guidance. At first blush, groundwater appears distinct from the federally regulated category of navigable waters. Advances in the fields of hydrology and technology, however, have shed significant light on the relationship between groundwater systems[7] and navigable waters.[8] While the traditional definition of navigable waters is itself strained,[9] the Fourth Circuit in *Sierra Club v. Virginia Electric & Power Co.* significantly hindered the rational application of the scope, meaning, and import of the CWA.

---

5. Sierra Club v. Va. Elec. & Power Co., 145 F. Supp. 3d 601 (E.D. Va. 2015), aff'd in part, rev'd in part, *Sierra Club v. Va. Elec. & Power Co.*, 903 F.3d 403, 404 (4th Cir. 2018).

6. *Compare* Haw. Wildlife Fund v. Cty. of Maui, 886 F.3d 737, 747 (9th Cir. 2018) (affirming that "an indirect discharge from a point source to a navigable water suffices for CWA liability to attach"), *and* Upstate Forever v. Kinder Morgan Energy Partners, 887 F.3d 637, 651 (4th Cir. 2018) (holding that a "direct hydrological connection between ground water and navigable waters" is necessary to establish a CWA claim), *with* Tenn. Clean Water Network v. Tenn. Valley Auth., 905 F.3d 436, 443–44 (6th Cir. 2018) (rejecting the EPA's hydrological connection theory, specifically finding that groundwater is not governed by the CWA), *and* Ky. Waterways All. v. Ky. Util. Co., 905 F.3d 925, 933 (6th Cir. 2018) (rejecting that the CWA governs pollution from groundwater that reaches surface waters).

7. *See* Peter J. Hancock et al., *Aquifers and Hyporheic Zones: Towards an Ecological Understanding of Groundwater*, 13 HYDROGEOLOGY J. 99-102 (2005) (referencing the value provided by advancements in groundwater ecology).

8. Clean Water Act, 33 U.S.C. § 1362(7) (2018).

9. *See generally* United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 133 (1985) ("[T]he evident breadth of congressional concern for protection of water quality and aquatic ecosystems suggests that it is reasonable for the Corps to interpret the term 'waters' to encompass wetlands adjacent to waters as more conventionally defined.").

At the heart of *Sierra Club v. Virginia Electric & Power Co*. is a fundamental misunderstanding of: (1) the inextricable relationship between groundwater and surrounding hydrological systems; (2) the water cycle as an inherent means of conveyance between point- and nonpoint sources of pollution; and (3) the linear connection between solid waste and its hazardous by-products. *Sierra Club v. Virginia Electric & Power Co.* may have a potentially detrimental influence on the evolution of groundwater regulation at both the state and federal level. In Part I, this Note will offer the factual and legal background of *Sierra Club v. Virginia Electric & Power Co*. In Part II, this Note will argue that the Fourth Circuit should not create an exception to the CWA's protection of groundwater that is hydrologically connected to point-source pollution. In Part III, this Note offers alternative solutions to the judicially inefficient interpretation of the CWA by advocating for amended state legislation for the management of groundwater pollution discharges. Finally, this Note concludes with a summary of the Fourth Circuit's improper interpretation and application of both the CWA and Fourth Circuit precedent and the author's proposed solution to amend state pollution discharge permits.

I. BACKGROUND

A. Factual Background

Appellee, Virginia Electric & Power Company (Dominion) owned and operated a coal-fired power plant in Chesapeake, Virginia.[10] As a result of the coal-combustion, the power plant produced coal ash:[11] a substance currently listed as solid, rather than hazardous, waste under Virginia law.[12] The Virginia Department of Environmental Quality ("VDEQ") permitted Dominion to store its coal ash waste in a landfill on site and in settling ponds.[13] Sometime after issuance of its VDEQ permit, Dominion reported to the agency a level of arsenic in the groundwater near its storage sites that exceeded Virginia's groundwater quality standards.[14] The arsenic was a direct byproduct of rain passing through the coal ash stored in the settling ponds and landfill.[15] Further, the Resource Conservation and Recovery Act

10. *Va. Elec. & Power Co.*, 145 F. Supp. 3d at 603.
11. *Id.*
12. 9 VA. ADMIN. CODE § 20-85-40(C)(1) (2020).
13. Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 405-06 (4th Cir. 2018).
14. *Id.* at 415.
15. *Id.* at 414.

(RCRA) lists arsenic as a hazardous waste.[16] Thus, Dominion's coal ash—currently regulated by states as solid waste—was the means through which arsenic was leaching into the groundwater and eventually, the Elizabeth River and Deep Creek.[17] Three years later, Appellee (Sierra Club) filed a citizen-suit in the District Court for the Eastern District of Virginia alleging that Dominion's unauthorized discharge of arsenic into the groundwater violated the CWA.[18]

B. Procedural Background

At the lower court, the Sierra Club alleged that Dominion had violated the CWA on three separate counts and requested comprehensive injunctive relief and civil penalties.[19] First, the Sierra Club asserted "[Dominion's] coal ash storage facilities were point sources and that arsenic leached from them into the groundwater, which was 'hydrologically connected' to the Elizabeth River and Deep Creek. . . ."[20] The lower court ruled in favor of the Sierra Club on this count, reasoning that the CWA indeed included discharges into groundwater that had a "direct hydrological connection" to navigable waters, thus triggering CWA protection.[21] In Counts Two and Three, the Sierra Club asserted that Dominion had violated two specific sections of its CWA discharge permit—issued by VDEQ—based on the same facts.[22] The lower court rejected Counts Two and Three because it deferred to VDEQ's decision that Dominion's discharge permit did not govern the leached arsenic into the groundwater.[23] For relief, the lower court denied civil penalties and granted limited injunction and required "Dominion to implement a plan in coordination with the VDEQ to address the [arsenic] pollution. . . ."[24]

Dominion then filed an appeal to the Fourth Circuit challenging the limited injunction, following which Sierra Club cross-appealed challenging the deference afforded to VDEQ, the denial of comprehensive injunctive relief, and the failure to award civil penalties.[25] The Fourth Circuit claimed to uphold its precedent and legal test from *Upstate Forever v. Kinder Morgan Energy Partners, L.P.* The legal test in *Upstate Forever* states, "the addition

16. *See* 42 U.S.C. § 6924(d)(2)(B)(i) (2018) (defining concentrations of arsenic and other compounds that create liquid hazardous wastes).
17. *Va. Elec. & Power Co.*, 903 F.3d at 406.
18. *Id.*
19. Sierra Club v. Va. Elec. & Power Co., 145 F. Supp. 3d 601, 603-04 (E.D. Va. 2015).
20. *Va. Elec. & Power Co.*, 903 F.3d at 406.
21. *Id.* at 408.
22. *Va. Elec. & Power Co.*, 145 F. Supp. 3d at 603-04.
23. *Va. Elec. & Power Co.*, 903 F.3d at 409.
24. *Id*.
25. *Id*.

of a pollutant into navigable waters via groundwater can violate [the CWA] if the plaintiff can show a 'direct hydrological connection between [the] groundwater and navigable waters.' "[26]

After affirming the lower court's factual finding in support of the Sierra Club on this issue, the Fourth Circuit then swiftly narrowed *Upstate Forever's* holding by reasoning that "the simple causal link [between groundwater and navigable water] does not fulfill the [CWA] requirement that the discharge be from a point source."[27] The Fourth Circuit then analyzed the CWA's defined terms in application to the facts of the present case. In relying on unrefined dictionary definitions, dispositive case law in other jurisdictions, and binding precedent in direct opposition to its holding, the Fourth Circuit ultimately held that Dominion was not in violation of the CWA because its storage facilities were not conveying arsenic to navigable waters.[28] Last, the Fourth Circuit then affirmed the lower court's denial of civil penalties and issuance of partial injunctive relief on behalf of the Sierra Club.[29]

C. Clean Water Act and Resource Conservation and Recovery Act Jurisdiction

Here, the true disputed pollutant is arsenic. This pollutant is postured at a unique intersection because it derives from coal ash—a substance states, including Virginia, regulate as a solid waste.[30] Further, the CWA governs the regulation of arsenic generally as a hazardous pollutant.[31] As result, the state of Virginia has had the authority to regulate: (1) coal ash leachate—arsenic—as solid wastes that (2) discharge from nonpoint sources of pollution:[32] storage facilities. The distinction the Fourth Circuit established between arsenic and coal ash-derived arsenic thus creates a perverse result.

Facially, Dominion's storage facilities are nonpoint sources of pollution to navigable waters. However, the natural hydrological system of rainfall conveyed the pollutant into the underlying groundwater. The lower court in *Virginia Electric & Power Co*. determined, as a matter of fact, that this groundwater was directly hydrologically connected to the Elizabeth River

---

26. *Id.* (quoting Upstate Forever v. Kinder Morgan Energy Partners, 887 F.3d 637, 638 (4th Cir. 2018)).
27. *Id.* at 410.
28. *Id.* at 413.
29. *Id.* at 415.
30. 9 VA. ADMIN. CODE § 20-85-40(C)(1) (2020).
31. 42 U.S.C. § 6921(b)(3)(A) (2018).
32. *Va. Elec. & Power Co.*, 903 F.3d at 407.

and Deep Creek.[33] Together, coal ash-derived arsenic leached into the underlying groundwater, which ultimately discharged into navigable waters.

While Dominion properly submitted a RCRA permit through VDEQ for the discharge of non-hazardous solid waste (e.g. coal ash), Dominion should have been required to stricter regulation under the CWA given that the operative pollutant is arsenic. To illustrate this point, the Agency for Toxic Substances and Disease Registry has ranked arsenic as the top priority pollutant at Superfund sites on the National Priorities List since 1997.[34] Superfund sites are areas within the U.S. that are contaminated "due to hazardous waste being dumped, left out in the open, or otherwise improperly managed."[35] The top priority substances are determined "based on a combination of their frequency, toxicity, and potential for human exposure."[36] While Dominion's power plant is not a Superfund site, the power plant facility is located less than five miles from a Superfund site.[37] Thus, proper permitting systems and judicial interpretation of the CWA are imperative given the degree of severity that arsenic poses to human and environmental health, especially within the Chesapeake, Virginia area.

33. *Id.* at 408.

34. *See ATSDR's Substance Priority List*, AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, https://www.atsdr.cdc.gov/spl/index.html#2019spl (last visited Mar.15, 2020) (listing, in order of priority, substances that most threaten human health according to the substances' known or suspected toxicity).

35. *What is Superfund*?, https://www.epa.gov/superfund/what-superfund (last visited Feb. 3, 2019).

36. *ATSDR's Substance Priority List*, *supra* note 34.

37. *See generally St. Juliens Creek Annex (U.S. Navy) Chesapeake, VA*, https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0302852#bkground (last visited Feb. 2, 2020) (summarizing the historical backdrop, clean-up activities, and current status of the St. Juliens Creek Annex Superfund Site).

II. ARGUMENT

A. The Fourth Circuit Should Not Create an Exception to the CWA's Protection of Groundwater that is Hydrologically Connected to Point Source Pollution

1. Recent Judicial Interpretation of "Waters of the United States" Demonstrates that Groundwater is not Categorically Excluded from of the Scope of the CWA

In 1972, the CWA expanded and amended the Federal Water Pollution Control Act of 1948.[38] The CWA's objective is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[39] While seemingly innocuous, the term "Nation's waters" has been a fulcrum of great debate in the United States' judiciaries, specifically within the arena of water and land-use regulation. For example, in 2015, the Obama Administration issued a "Waters of the United States Rule" (Clean Water Rule) that was "designed to limit pollution in about 60 percent of the nation's bodies of water."[40] The Clean Water Rule signaled a national commitment to restore protection of the Nation's waters, as originally intended in the CWA.[41] After the Trump administration took office, however, former Environmental Protection Agency (EPA) Director Scott Pruitt suspended the Clean Water Rule.[42] A federal judge later determined that this action violated the Administrative Procedure Act because the Trump Administration failed to take public comments on the then–proposed suspension.[43] As result, twenty-six states still apply the Clean Water Rule. While the Clean Water Rule articulates the scope and import of the CWA to protect "seasonal streams, lakes, and wetlands," the backdrop to the Clean Water Rule offers invaluable insight into the history of the CWA's judicial interpretation.[44]

---

38. *Summary of the Clean Water Act*, https://www.epa.gov/laws-regulations/summary-clean-water-act (last visited Mar. 19, 2020).

39. 33 U.S.C. § 1251(a) (2018).

40. Coral Davenport, *E.P.A. Blocks Obama-Era Clean Water Rule* (Jan. 31, 2018), https://www.nytimes.com/2018/01/31/climate/trump-water-wotus.html.

41. *See generally Clean Water Rule*, NAT. RES. DEF. COUNCIL, https://www.nrdc.org/court-battles/clean-water-rule (last updated Jan. 23, 2020) (highlighting the Clean Water Rule's role in protecting drinking water, streams, and wetlands).

42. Jackie Flynn Mogensen, *Scott Pruitt Suspends Obama-Era Clean Water Rule for Two Years* (Feb. 1, 2018), https://grist.org/article/scott-pruitt-suspends-obama-era-clean-water-rule-for-two-years/.

43. S.C. Coastal Conservation League v. Pruitt, 318 F. Supp. 3d 959, 963-68 (D.S.C. 2018).

44. *See* Heather Smith, *So WOTUS is Legal. Now What?* (Sept. 26, 2018), https://www.sierraclub.org/sierra/so-wotus-legal-now-what-clean-water-rule-climate-change (describing and relating *Rapanos* to the 2015 Clean Water Rule).

While the term "waters of the United States" has been widely debated in the U.S. judiciaries, the Trump administration recently added a new wrinkle to the term's definition. On December 11, 2018, the Trump Administration issued a proposed "Waters of the U.S." rule that would significantly narrow the scope of the CWA.[45] Under the new proposed rule, wetlands and ephemeral and intermittent streams would no longer receive protection under the CWA. Critics of the proposed rule suggest it would severely restrict "federal oversight of resources that cleanse pollution, buffer storms and provide wildlife habitat."[46] However, the proposed rule is not yet final, so the Obama-era Clean Water Rule still stands. As is, the Clean Water Rule reflects a culmination of in-depth scientific and legal research.[47]

Justice Kennedy's opinion in the seminal Supreme Court case, *Rapanos v. United States*, largely molded the Clean Water Rule.[48] The *Rapanos* plurality opinion partially answered the question of what the terms "waters of the United States" and "navigable waters" mean under the CWA.[49] In *Rapanos*, Petitioner John Rapanos challenged the lower court decision that Michigan wetlands were within the scope of CWA protection.[50] The EPA had sued Mr. Rapanos for failing to procure the necessary CWA permits to fill in these wetlands to build a shopping mall in their place.[51] Writing for the plurality, Justice Scalia relied on prior Supreme Court precedent from both *United States v. Riverside Bayview Homes, Inc*. and *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* in determining that the definition of "waters of the United States" under the CWA includes only:

> those relatively permanent, standing or continuously flowing bodies of water 'forming geographic features' that are described in ordinary parlances as 'streams, 'oceans, rivers [and] lakes,' . . . and does not include channels through which water flows intermittently or

45. Ariel Wittenberg, *How Does Trump Compare to Obama on WOTUS?* (Dec. 12, 2018), https://www.eenews.net/stories/1060109451.

46. *Id*.

47. *Efforts Underway to Repeal and Replace the 2015 Clean Water Rule,* N. AM. LAKE MGMT. SOC'Y (Aug. 15, 2017), https://www.nalms.org/efforts-underway-to-repeal-and-replace-the-2015-clean-water-rule/.

48. *See generally* Rapanos v. United States, 547 U.S. 715 (2006) (determining the scenarios when wetlands are covered by the Clean Water Act).

49. *See id.* at 716 (defining "waters of the United States" and "navigable waters" as "only those relatively permanent, standing or continuously flowing bodies of water 'forming geographic features' that are described in ordinary parlance as 'streams,' 'oceans, rivers, [and] lakes'").

50. *Id.* at 729-30.

51. *Id.* at 763-65 (Kennedy, J., concurring).

> ephemerally, or channels that periodically provide drainage for rainfall.[52]

In arriving at his definition of "waters of the United States," Justice Scalia relied heavily on the use of dictionary definitions, rather than the Congressional Record.[53] Relying on dictionary definitions here arguably inflicts a large disservice to the complex nature both of hydrology and the import of the CWA. While the plurality opinion ultimately concluded that the disputed wetlands were outside of the scope of the U.S. Army Corps of Engineers' (ACE) permitting jurisdiction under the CWA, the plurality nonetheless held that wetlands adjacent to traditionally navigable waters could be within ACE's CWA jurisdiction.[54] Justice Kennedy opined in his concurrence that the regulation of the disputed wetlands under the CWA was outside of the scope of ACE's permitting jurisdiction.[55] However, Justice Kennedy reasoned that the general ACE permitting jurisdiction of wetlands must be over those that have a "significant nexus" to the traditionally navigable-in-fact waters of the United States.[56] Because Justice Kennedy was the sole concurrence, the Obama Administration relied on Justice Kennedy's rationale in shaping the Clean Water Rule.[57] Thus, understanding the holding of *Rapanos* is essential in identifying the lack of clear judicial consensus of the meaning of the term "waters of the United States" in relation to the reach of the CWA. Though *Rapanos* analyzed the CWA's application to wetlands, the broader tests identified therein stand to minimally suggest that groundwater is not categorically excluded from CWA protection.

The "significant nexus" test Justice Kennedy articulated in his *Rapanos* concurrence provides a necessary lens through which to evaluate the Fourth Circuit's judgment in *Virginia Electric & Power Co.* As such, the CWA

---

52. *Id.* at 716; *see generally* Solid Waste Agency of N. Cook Cty v. U.S. Army Corps of Eng'rs., 531 U.S. 159, 159 (2001) [hereinafter SWANCC], (holding that the Army Corps of Engineers had exceeded its authority in extending the definition of "waters of the United States" to include waters that are habitat for migratory birds); *see also* United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 133 (1985) (noting that the term 'navigable' is of 'limited import' and that Congress evidenced its intent to 'regulate at least some waters that would not be deemed "navigable under [that term's] classical understanding"').

53. Mark A. Ryan, *Turtles All the Way Down: Justice Scalia and the Clean Water Act* (Nov. 1, 2016), https://www.americanbar.org/groups/environment_energy_resources/publications/trends/2016-2017/november-december-2016/turtles_all_the_way_down/.

54. *Rapanos*, 547 U.S. at 742.

55. *Id.* at 779-84 (Kennedy J., concurring).

56. Wade Foster, *Parsing Rapanos*, HARVARD ENVTL. L. REV. SYNDICATE (Apr. 7, 2018), https://harvardelr.com/2018/04/07/2642/.

57. *See* Ariel Wittenberg, *With Kennedy's Exit, Tide Turns on Clean Water Rule* (June 28, 2018), https://www.eenews.net/greenwire/2018/06/28/stories/1060087265 (explaining how the Obama administration designed the Clean Water Rule around Justice Kennedy's sole concurrence in *Rapanos* to ensure the "swing" vote would side with the administration is now gone the tables are turning).

governs a body of water if the water "either alone or in combination with similarly situated lands in the region, significantly affects the chemical, physical, and biological integrity" of traditionally navigable waters.[58] In *Virginia Electric & Power Co.*, the disputed water was the groundwater under Dominion's coal-ash landfills and settling ponds.[59] Though the operative issue in *Virginia Electric & Power Co*. was whether arsenic derived from coal ash triggers CWA protection,[60] Justice Kennedy's "significant nexus" test is critical to apply in first determining whether the groundwater polluted under Dominion's storage facilities falls under CWA's "waters of the United States."

The groundwater in dispute ultimately feeds into the Elizabeth River and Deep Creek in Chesapeake, Virginia. The lower court established, as a matter of fact, that the discharged arsenic from Dominion's coal-ash storage facilities indeed entered into these rivers via groundwater.[61] Moreover, the Fourth Circuit implicitly answered whether Justice Kennedy's "significant nexus" test applied in the given case.[62] As such, in *Upstate Forever*, the Fourth Circuit held that "the addition of a pollutant into navigable waters via groundwater can violate [the CWA] if [a] plaintiff can show a 'direct hydrological connection' between the ground water [sic] and navigable waters."[63]

The *Upstate Forever* test is highly reminiscent of Justice Kennedy's "significant nexus" test. The *Upstate Forever* test contemplates the ecological nature of traditionally navigable waters and the natural hydrological cycles between groundwater and surface water.[64] Both tests are arguably satisfied in *Virginia Electric & Power Co.* because the lower court found, as a matter of fact, that the arsenic in the nearby (traditionally navigable) waters was a direct result of pollutant discharge from Dominion's coal-ash storage facilities.[65] The groundwater beneath Dominion's storage facilities migrated into the traditionally navigable waters of the Elizabeth River and Deep Creek, which carried with it the arsenic pollution.[66] The coal ash leachate from Dominion's facilities, in combination with the natural processes of rainfall through the storage facilities,[67] significantly affected the

58. *Rapanos*, 547 U.S. at 780 (Kennedy J., concurring).
59. Sierra Club v. Va. Elec. & Power Co., 145 F. Supp. 3d 601, 603, 607 (E.D. Va. 2015).
60. Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 409 (4th Cir. 2018).
61. *Va. Elec. & Power Co.*, 143 F. Supp. 3d at 607.
62. *Va. Elec. & Power Co.*, 903 F.3d at 409-10.
63. *Id.* at 409.
64. *Id.*
65. *Va. Elec. & Power Co.*, 145 F. Supp. 3d at 607.
66. *Id.*
67. *See* AMRIKA DEONARINE ET AL., U.S. GEOLOGICAL SURVEY, TRACE ELEMENTS IN COAL ASH 1 (2015) (explaining that "[c]oal ash generated from coal combustion is collected and stored or reused for

chemical integrity of the Elizabeth River and Deep Creek. The groundwater in question thus bears a significant hydrological connection to the bodies of water that received Dominion's arsenic pollution.

Neither Dominion nor the Fourth Circuit disagreed with the lower court's determination that there was a significant hydrological connection between the groundwater and the identified bodies of water into which the arsenic pollution ultimately discharged. The remainder of the Fourth Circuit's analysis in *Virginia Electric & Power Co.*, however, seemingly abandoned the established principle that groundwater pollution can trigger CWA protection if it satisfies the "significant nexus" test. The Fourth Circuit's flawed analysis of arsenic as a regulated toxic pollutant under the EPA's CWA jurisdiction will be discussed next in this Note.

2. Coal Ash-Derived Arsenic is a Toxic Pollutant Under 40 C.F.R. § 401.15

Both the EPA and states share authority under the CWA to administer § 402 discharge permits.[68] Section 402 of the CWA governs the National Pollutant Discharge Elimination System (NPDES) program that requires any polluter to obtain a permit for the "discharge of any pollutant."[69] Under the CWA, discharge of any pollutant means "any addition of any pollutant into navigable waters from any point source."[70] As previously discussed, "navigable waters" means "waters of the United States."[71] Though the lower court in *Virginia Electric & Power Co.* found that the discharged arsenic had leached from Dominion's coal ash, Dominion did not have to apply for a § 402 discharge permit because the storage facilities were not point sources under the CWA.[72] Therein lies one of the largest flaws in the § 402 permitting system as it currently exists.

---

other purposes," and that "[p]recipitation (rain and snow) can lead to water infiltration through the ash into groundwater aquifers, soil, lakes, and rivers." Further, "[i]n the United States, coal ash is currently disposed of in ash impoundments or landfills. Storage or disposal of large volumes of coal ash in suitably engineered and monitored impoundments or landfills is costly and may be limited by near-site storage capacities. Long-term storage of coal ash can cause pollution because water infiltration (from rain or snow) combined with leaky storage sites may transport coal ash and its constituent elements into the local environment. If ash impoundments fail, there is potential for widespread and prolonged impacts such as impairment of ecosystem functions and the loss of plant and animal life and habitat.").

68. *See NPDES State Program Authorization Information*, https://www.epa.gov/npdes/npdes-state-program-information (last visited Mar. 23, 2020) (outlining how states can submit applications for EPA authorization to administer the NPDES program).

69. 33 U.S.C. § 1342(a)(1) (2018).

70. *Id.* § 1362(12).

71. *Id.* § 1362(7).

72. *See* Sierra Club v. Va. Elec. & Power Co., 247 F. Supp. 3d 753, 755 (E.D. Va. 2017) (acknowledging discharge of arsenic from Dominion's facility).

Because the EPA does not currently list coal ash as a toxic pollutant under the CWA,[73] Dominion did not need to obtain a § 402 permit for its coal ash storage facilities. Instead, the Resource Conservation and Recovery Act (RCRA) required, and Virginia's Department of Environmental Quality (VDEQ) issued, Dominion a solid-waste permit.[74] The CWA does not directly govern coal ash storage facilities because the EPA has classified coal ash as "nonhazardous waste."[75] Consequently, coal ash storage facilities are regulated by RCRA and "remain 'primarily the function of State, regional, and local agencies' with the 'financial and technical assistance and leadership' of federal authorities."[76] The state of Virginia, for example, has volitionally elected to implement permitting programs under both the CWA and RCRA.[77] Thus, § 402 permitting considerations did not directly factor into Dominion's requires permits for the discharge of coal ash.

For its coal ash-settling ponds, Virginia's Waste Management Act (WMA) required Dominion to obtain and adhere to VDEQ's pollutant discharge system.[78] Though the WMA implements the EPA's "minimum national criteria" for coal ash sites, VDEQ retains primary authority for issuing WMA pollutant discharge permits.[79] Dominion was required to obtain a VDEQ-issued RCRA solid-waste permit for its coal ash landfill.[80] Pursuant to its RCRA permit, Dominion was required to "monitor the groundwater on the peninsula" adjacent to its storage facility.[81] Taken together, VDEQ had near-exclusive authority over Dominion's permits for its coal ash storage facilities. In compliance with its permit conditions, Dominion discovered that its coal ash storage facilities were discharging arsenic into the groundwater in excess of Virginia's groundwater protection

73. *See generally* 40 C.F.R. § 401.15 (2018) (listing toxic pollutants under the effluent standards and guidelines).

74. *See generally id.* § 257 (2018) (describing which solid waste disposal facilities and practices are subject to RCRA); *id.* § 261.4 (listing exclusions from solid waste classification); Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 407 (4th Cir. 2018) (discussing the permitting duties of VDEQ under the Clean Water Act and RCRA).

75. 40 C.F.R. §§ 257, 261.4 (2018); *see also* Jonathan Kaminsky, *Coal Ash is Not Hazardous Waste Under U.S. Agency Rules*, REUTERS: SUSTAINABILITY (Dec. 19, 2014), https://in.reuters.com/article/us-usa-power-coalash/coal-ash-is-not-hazardous-waste-under-u-s-agency-rules-idINKBN0JX15X20141220 (discussing that the EPA relegates authority to regulate coal ash under RCRA).

76. *Va. Elec. & Power Co.*, 903 F.3d at 407; *see* 42 U.S.C. § 6901(a)(4) (2018) (outlining jurisdictional responsibility for collecting and disposing solid waste).

77. *See* VA. CODE ANN. § 62.1-44.5 (West 2020) (enacting permitting program under CWA); *id.* § 10.1-1400 (West 2020) (enacting permitting program under RCRA).

78. *Va. Elec. & Power Co*., 903 F.3d at 407.

79. *Id.*

80. *Id.*

81. *Id.* at 408.

standards.[82] Dominion then reported the arsenic groundwater pollution to VDEQ and submitted a "corrective plan," which VDEQ approved roughly six years thereafter.[83] In 2016, Dominion submitted a "closure plan and post-closure plan" for its coal ash storage facilities.[84] Shortly thereafter, the Sierra Club filed a citizen-suit under § 1365 of the CWA.[85] The progression of Dominion's arsenic discharge demonstrates the fundamental flaw in coal ash regulation.

First, arsenic leached from the coal ash deposited by Dominion into its storage facilities. Though Dominion complied with its pollutant discharge permits, the issue here spans further than what the Fourth Circuit held in *Virginia Electric Power & Co.* Given the threat arsenic poses to both human and environmental health, the EPA should directly regulate coal ash leachate under its CWA authority. To better illustrate this point, the EPA's CWA regulations currently list arsenic as a toxic pollutant.[86] Together with the EPA final rule listing coal ash as a "nonhazardous waste," courts like the Fourth Circuit in *Virginia Electric Power & Co.* have made a difference without distinction between arsenic and coal ash-derived arsenic.

Arsenic and arsenic compounds are carcinogenic substances that can either be inorganic or organic.[87] Moreover, the Centers for Disease Control and Prevention reports that "exposure to high levels of inorganic arsenic in drinking water is associated with . . . skin disorders, an increased risks for diabetes, high blood pressure, and several types of cancer."[88] The arsenic that leached from Dominion's coal ash storage facilities was inorganic, as it was not naturally occurring in the groundwater below and nearby Dominion's storage facilities.[89] Given the threat that arsenic poses to both human and environmental health and safety, regulatory agencies and courts should more closely examine the relationship between coal ash and inorganic arsenic, specifically within the scope of groundwater regulation. In *Virginia Electric Power & Co.*, the Fourth Circuit wholly deferred to the established EPA rule that coal ash is a nonhazardous waste.[90] This was a proper interpretation of

---

82. *Id.*
83. *Id.*
84. *Id.*
85. *Id.*
86. *See generally* 40 C.F.R. § 401.15 (2018) (listing toxic pollutants under the effluent standards and guidelines).
87. *Arsenic Factsheet*, CTR. FOR DISEASE CONTROL & PREVENTION, https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html (last reviewed Apr. 7, 2017).
88. *Id.*
89. *Va. Elec. & Power Co.*, 903 F.3d at 411 (describing the arsenic pollution from Dominion's storage facilities).
90. *See id.* at 407 (deferring to "RCRA" and how it classifies coal ash facilities as nonhazardous).

the EPA rule, as well as VDEQ's permitting system under the CWA and RCRA. This comment argues, however, that the judiciary would not be legislating from the bench to simply highlight the glaring inconsistency between arsenic and coal ash-derived arsenic regulation.

While the EPA identifies arsenic as a toxic pollutant, the classification somehow disappears altogether when arsenic is a by-product of coal ash.[91] Therein lies the fatal difference without distinction. The EPA and some judiciaries have conveniently couched coal ash as distinct from hazardous waste, yet coal ash often serves as the starting point for other highly hazardous wastes like arsenic and other toxic metals.[92] Though coal ash and arsenic are distinct from one another in isolation, the Fourth Circuit improperly overlooked the genesis of such inorganic arsenic in the nation's groundwater: coal ash.

The coal ash from Dominion's power plant resulted from the combustion of coal to produce energy.[93] Burning coal creates waste that can include "fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) sludge."[94] Dominion deposited this industrial waste in two common facilities for coal ash storage: (1) landfills and (2) wet settling ponds.[95] Ordinarily, composite liners below landfills and settling ponds prevent leachate releases[96] from coal ash from entering the underlying soil and groundwater. Composite liners can "include a flexible membrane . . . overlaying two feet of compact clay soil lining the bottom and sides" of storage facilities.[97] Composite liners, though

---

91. *See* Jay Crowder, *Notice to SCOTUS: Coal Ash Should Be a Point Source Discharge Under the Clean Water Act*, 19 VT. J. ENVTL. L. 89, 91 (2018) (explaining the CWA treats coal ash as a nonpoint source, preventing the CWA from directly regulating it).

92. *See Water & Food Supply,* SIERRA CLUB: BEYOND COAL, https://coal.sierraclub.org/the-problem/water-food-supply (last visited Mar. 2, 2020) (describing the dangers of coal ash waste and toxins disposed by coal plants).

93. Jessica Lienau, *Coal Ash Waste: A History of Legislative Inaction*, 14 PUB. INT. L. REP. 141, 142 (2009).

94. Ethan Goemann, *Surveying the Threat of Groundwater Contamination from Coal Ash Ponds*, 25 DUKE ENVTL. L. & POL'Y F. 427, 428 (2015) (citing LINDA LUTHER, CONG. RESEARCH SERV., REGULATING COAL COMBUSTION WASTE DISPOSAL: ISSUES FOR CONGRESS 22 (2010) [hereinafter REGULATING COAL COMBUSTION WASTE DISPOSAL] (defining fly ash as "a product of burning finely ground coal in a boiler to produce electricity . . . consist[ing] of mostly silt-sized and clay-sized glassy spheres;" FGD material as a product of the "chemical process implemented in order to meet emission requirements in the Clean Air Act applicable to sulfur dioxide . . . [that] may be a wet sludge or a dry powder;" bottom ash as "a coarse, gritty material . . . too large to be carried in flue gases;" and boiler slag as a "type of ash that collects at the base of certain furnaces that are quenched with water [and then] fracture, crystallize, and form pellets")).

95. *Va. Elec. & Power Co.*, 903 F.3d at 406; *see also* PHYSICIANS FOR SOCIAL RESPONSIBILITY, COAL ASH: HAZARDOUS TO HUMAN HEALTH 1 (2010) (describing options for coal ash storage).

96. *Municipal Solid Waste Landfills*, https://www.epa.gov/landfills/municipal-solid-waste-landfills (last visited Feb. 7, 2020). Leachate is "formed when rain water [sic] filters through wastes placed in a landfill." *Id.* "When the liquid comes into contact with buried wastes, it leaches, or draws out, chemical or constituents from those wastes." *Id.*

97. *Id.*

not wholly preventative, are critical barriers that mitigate the entrance of coal ash leachate from entering into the underlying groundwater. In 2010, however, the EPA published survey data regarding coal-combustion-waste-disposal units and reported "36% of responding states do not have minimum liner requirements for landfills, 67% do not have liner requirements for surface impoundments, 19% of the responding states do not have minimum groundwater monitoring for landfills, and 61% do not have minimum groundwater monitoring for surface impoundments."[98]

Prior to 2015, the EPA did not require composite liners for coal-combustion landfills and settling ponds,[99] which left groundwater–and hydrologically connected navigable waters–largely exposed to coal ash-leachate pollution. The EPA promulgated a final rule titled the "Disposal of Coal Combustion Residuals from Electric Utilities," which, in part, set national minimum criteria requirements for lining coal combustion waste disposal facilities.[100] The EPA specified that RCRA Subtitle D confers the statutory authority for this rule, which governs hazardous solid waste management and disposal.[101] The rule applies to all new and existing coal combustion waste landfills and settling ponds.[102] While the minimum criteria requirements for composite liners appear to be a step in the right direction, the EPA "proposed this option to be a self-implementing rule with no direct federal oversight."[103]

Under the rule, Dominion should have installed retrofitted composite liners on its coal ash landfill and settling pond at its Chesapeake site. While Dominion's facilities were well over 60 years old at the time the Sierra Club filed suit, Dominion did not line either of their facilities under the Disposal of Coal Combustion Residuals from Electric Utilities final rule.[104] Dominion was able to continue polluting the underlying groundwater beneath the facilities largely because of the "self-implementing" nature of the rule. Consequently, Dominion's coal ash leachate had percolated into the underlying groundwater with no barrier for over half a century and ultimately discharged into the Elizabeth River and Deep Creek. In a larger context, Dominion's pollution of the Elizabeth River and Deep Creek evinces that–while theoretically significant–the Disposal of Coal Combustion Residuals from Electric Utilities final rule lacks enforceable teeth. Without federal

98. REGULATING COAL COMBUSTION WASTE DISPOSAL, *supra* note 94, at 9.

99. *See* Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. 21,301, 21,306 (Apr. 17, 2015) (adding new coal ash landfill requirements, including composite liners).

100. *Id.*

101. 40 C.F.R. §§ 261.30–261.35 (2020).

102. Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. at 21,303.

103. *Id.*

104. Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 405 (4th Cir. 2018); 40 C.F.R. §§ 257, 261 (2020).

oversight, electrical power plants like Dominion can easily evade the national minimum criteria requirements for composite liners promulgated by the EPA.

3. Coal Ash Settling Ponds Qualify as Point Sources of Pollution Because Rainfall is a Valid Means of Conveyance Under the CWA

In order for Dominion to be liable under the CWA, the Sierra Club would have had to prevail on its argument that Dominion's coal ash storage facilities constituted "point sources" under the CWA. Within the CWA, the definition of point sources is "discernable, confined, and discrete conveyance[s]."[105] The operative, but complex, issue the Fourth Circuit answered in *Virginia Electric & Power Co.* was whether Dominion's storage facilities constituted point sources because "they allow[ed] precipitation to percolate through them to the groundwater, which then carries arsenic to navigable waters."[106] Thus, the issue equally turns on whether rainwater—an immutable and natural hydrological cycle of water—constitutes a conveyance of arsenic from either a landfill, settling pond, or both.

The Fourth Circuit agreed with Dominion's contention that both landfills and settling ponds are not within the CWA's statutory definition of point sources.[107] In arriving at its conclusion, the Fourth Circuit articulated a seemingly result-oriented rationale, offering that:

> while arsenic from the coal ash stored on Dominion's site was found to have reached navigable waters–having been leached from the coal ash by rainwater and groundwater and ultimately carried by groundwater into navigable waters–that simple causal link does not fulfill the Clean Water Act's requirement that the discharge be *from a point source*.[108]

The Fourth Circuit, however, failed to analyze each storage facility against the CWA definition of point sources. Specifically, CWA point sources include, but are "not limited to[,] any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft."[109] While the Fourth Circuit may be narrowly correct in determining that Dominion's coal ash landfill is not a

105. 33 U.S.C. § 1362(14) (2018).
106. *Va. Elec. & Power Co.*, 903 F.3d at 410.
107. *Id.* at 411.
108. *Id.* at 410 (emphasis in original).
109. 33 U.S.C. § 1362(14).

point source of pollution, it did not separately analyze Dominion's settling ponds with the meaning of the CWA.

A coal ash-settling pond, which functions as an impoundment for wet coal ash, falls squarely within the definition of a "container" under the CWA. Settling ponds collect pollutants in a singular location. By failing to analyze the nature of settling ponds, the Fourth Circuit prematurely concluded that settling ponds are categorically excluded from the CWA's point source definition.[110] The Fourth Circuit then relied on dictionary definitions of the term "conveyance" to conclude that the storage facilities do not constitute point sources simply because they "were not created to convey anything and did not function in that manner."[111]

Similar to Justice Scalia's plurality opinion in *Rapanos*, dictionary definitions in groundwater law contexts are insufficient to properly analyze the meaning and import of the CWA. Put simply, neither hydrologists nor the drafters of the CWA contributed to definitions within Webster's dictionary—used both in *Rapanos* and *Virginia Electric Power & Co*.[112] Courts must, therefore, exercise tailored discretion in relying on dictionary definitions of the term "conveyance." In *Virginia Electric Power & Co.*, Dominion's coal ash-settling ponds indeed conveyed arsenic into the underlying groundwater via rainfall percolation, as evidenced by Dominion's own admission.[113]

The Fourth Circuit oversimplified the complex nature of the relationship between diffused arsenic and rainfall percolation. The settling pond was not a static recipient of rainfall. Rather, both the settling pond and the landfill were active conveyances of arsenic through the concentrations of coal ash on the facilities' surfaces. The following section will evaluate the hydrological connection between groundwater and surface water as it relates to the percolation of diffuse-arsenic pollution.

110. *Va. Elec. & Power Co.*, 903 F.3d at 410–11.

111. *Id.* at 411.

112. *See id.* at 410-11 (citing Webster's Dictionary); Rapanos v. United States, 547 U.S. 715, 716 (2006) (citing Webster's Dictionary).

113. *Va. Elec. & Power Co.*, 903 F.3d at 410.

B. The Fourth Circuit Improperly Ignored the Relationship Between Groundwater and Surface Water

1. The Transfer of Arsenic from Groundwater to Nearby Surface Waters Demonstrates the Natural Network of Water Migration Between Groundwater and Nearby Surface Waters

The difference the Fourth Circuit drew between point and nonpoint sources of pollution is grounded in a narrow legal interpretation that ignores scientific evidence. The United States Geological Survey (USGS) reports:

> Ground-water chemistry and surface-water chemistry cannot be dealt with separately where surface and subsurface flow systems interact. The movement of water between ground water and surface water provides a major pathway for chemical transfer between terrestrial and aquatic systems. . . . This transfer of chemicals affects the supply of carbon, oxygen, nutrients such as nitrogen and phosphorus, and other chemical constituents that enhance biogeochemical processes on both sides of the interface. This transfer can ultimately affect the biological and chemical characteristics of aquatic systems downstream.[114]

Groundwater migrates to surface waters via the hydrologic cycle.[115] The hydrologic cycle "describes the continuous movement of water on, above, and below the surface of the Earth."[116] Though the hydrologic cycle does not have a discernable beginning or end, precipitation is often the first step addressed in describing this continuous cycle.[117]

When precipitation (rain, snow, and hail) falls onto the Earth's surface, the water infiltrates the soil, and the relative speed at which this occurs depends largely on the character and properties of the soil type.[118] When precipitation completely saturates the soil, water migrates from the "unsaturated zone to the saturated zone, replenishing or recharging the

---

114. *Natural Processes of Ground-Water and Surface-Water Interaction*, U.S. GEOLOGICAL SURVEY., https://pubs.usgs.gov/circ/circ1139/htdocs/natural_processes_of_ground.htm (last modified Nov. 23, 2016).

115. U.S. ENVTL. PROT. AGENCY, GROUNDWATER 2-3 [hereinafter EPA GROUNDWATER SUMMARY], https://www.epa.gov/sites/production/files/documents/groundwater.pdf.

116. *The Water Cycle for Adults and Advanced Students*, U.S. GEOLOGICAL SURVEY, https://www.usgs.gov/special-topic/water-science-school/science/water-cycle?qt-science_center_objects=0#qt-science_center_objects (last visited Feb. 2, 2020).

117. EPA GROUNDWATER SUMMARY, *supra* note 115, at 2.

118. *Id.*

groundwater."[119] Water then migrates into the groundwater discharge areas.[120] For purposes of this discussion, the character of the soil beneath Dominion's coal-combustion waste facilities is inapposite because the trial court determined, as a matter of fact, that Dominion's coal ash leachate caused the heightened levels of arsenic in nearby surface waters.[121] The Elizabeth River and Deep Creek were the points of receipt—the discharge areas[122]—for Dominion's coal ash leachate. As such, the leachate migrated from the underlying groundwater beneath Dominion's storage facilities into those nearby surface waters. This process began with natural precipitation: rainfall.

By failing to address that rainfall is an immutable part of the natural hydrologic cycle, the Fourth Circuit in *Virginia Electric & Power Co.* improperly ignored how Dominion's coal ash storage facilities conveyed the leachate into the underlying groundwater. Rainfall percolation can cause arsenic—among a variety of other coal ash constituents—to leach into the soil underlying coal ash storage facilities. As previously discussed, Dominion's coal ash storage facilities were unlined, which allowed the coal ash leachate to migrate freely into the underlying soil and groundwater. This conveyance thus began with the historic rainfall that saturated both of Dominion's storage facilities that contained coal ash for over 60 years.[123] Further, because Dominion failed to implement composite liners beneath its storage facilities, the migration of the coal ash leachate was arguably inevitable. The nature of rainfall as the relevant starting point for this pollution process buttresses the argument that Dominion's storage facilities are well within the meaning of "discernable, confined, and discrete conveyance[s]."[124] The Fourth Circuit in *Virginia Electric & Power Co.* narrowly avoided this result by disregarding both: (1) the chemical transfer of arsenic from groundwater to nearby surface waters and (2) the natural network of water migration.

---

119. *Id.* at 3.

120. *Id.*

121. Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 410 (4th Cir. 2018).

122. *See* EPA GROUNDWATER SUMMARY, *supra* note 115, at 3 (describing interface between ground and surface waters at discharge areas).

123. *Va. Elec. & Power Co.*, 903 F.3d at 405, 410.

124. 33 U.S.C. § 1362(14) (2018).

III. ALTERNATIVE SOLUTIONS

A. A Recent Supreme Court Order Suggests the Supreme Court may Soon Decide the Scope of the CWA Regarding Groundwater Pollution

The defendants in both *Upstate Forever*[125] and *Hawai'i Wildlife Fund v. County of Maui* (*Hawai'i Wildlife Fund*)[126] submitted petitions for writs of certiorari to the Supreme Court to review the Fourth and Ninth Federal Circuit Courts of Appeals' holdings that the CWA "applies to groundwater pollution that reaches navigable waters, if the pollution can be sufficiently traced back to an identifiable 'point source' such as a pipeline, disposal well or drain."[127]

On December 3, 2018, the Supreme Court requested of the federal government to file a brief no later than January 4, 2019 detailing the United States' opinion(s) on the issues presented by *Upstate Forever* and *Hawai'i Wildlife Fund*.[128] On January 3, 2019, the Solicitor General filed a brief, which recommended that the Supreme Court hear the *Hawai'i Wildlife Fund* petition while holding the Upstate Forever petition.[129] The Court maintains the ability to hear one, both, or neither of the aforementioned cases,[130] and the deadline imposed on the Solicitor General suggests that the Court may intend to decide these cases before the end of the current term.[131] Until the Court issues a decision, however, Virginia should adopt state legislation that covers permitting systems for the migration of coal ash from groundwater into surface waters.

---

125. *See generally* Upstate Forever v. Kinder Morgan Energy Partners, 887 F.3d 637 (4th Cir. 2018) (identifying Kinder Morgan Energy Partners, L.P. as the defendant who submitted the petition).

126. *See generally* Haw. Wildlife Fund v. Cty. of Maui, 886 F.3d 737 (9th Cir. 2018), *petition for cert. filed* (U.S. Aug. 27, 2018) (NO. 18-260) (identifying County of Maui as the petitioner).

127. Barbara Grzincic, *Supreme Court Seeks U.S. Views in Two Clean Water Act Cases* (Dec. 5, 2018), https://uk.mobile.reuters.com/article/amp/idUSL1N1YA0J1.

128. Ellen M. Gilmer, *Groundwater's Muddy Legal History Under the Clean Water Act* (Dec. 4, 2018), https://www.eenews.net/stories/1060108689.

129. *See* Dianne R. Phillips, *Solicitor General Tells SCOTUS EPA Poised to Act on CWA Comments* (Jan. 9, 2019), https://www.lexology.com/library/detail.aspx?g=d00cf8d9-23c8-4e18-949c-8bafaf7cffb4 (discussing the Solicitor's recommendation); *see generally* Brief for the United States as Amicus Curiae, Vided, Cty. of Maui v. Haw. Wildlife Fund, No. 18-260, Kinder Morgan Energy Partners v. Upstate Forever, No. 18-268 (Cty. of Maui v. Haw. Wildlife Fund argued Nov. 6, 2019) (containing Solicitor General's recommendation).

130. *See* Gilmer, *supra* note 128 (discussing the circuit split and the potential role of the Supreme Court).

131. Amy Howe, *Two New CVSGs–On a Deadline* (Dec. 3, 2018), http://www.scotusblog.com/2018/12/two-new-cvsgs-on-a-deadline/.

B. Until the Supreme Court Issues Proper Guidance, Virginia Should Implement Stricter State Legislation that Fills in the Gaps of the NPDES

The Trump Administration's EPA and the Supreme Court will continue the debate of whether groundwater pollution migrating to navigable waters triggers CWA protection. In the interim, however, Virginia should take affirmative action and enact state legislation that bolsters protection against its groundwater pollution. Currently, the Virginia state legislature has a handful of Senate bills that may prove useful in compensating for the inconsistent CWA interpretations. For purposes of this comment, four bills introduced by state Senator Scott A. Surovell will be discussed in turn.

First, Virginia Senate Bill 765 (S.B. 765) would require the owner or operator of any coal ash pond in the Chesapeake Bay watershed that has been closed by "capping in place" to conduct mandatory testing of drinking water wells.[132] "Capping in place" is the method of covering, or "capping," contaminated materials from coal-combustion waste disposal sites after the facility closes.[133] Under S.B. 765, independent well water tests must be conducted "once per year during each of the five years following the approval . . . of the closure by capping in place of the coal ash pond and . . . once every five years thereafter."[134]

Further, the bill provides that an owner or operator of a closed coal ash pond in the Chesapeake Bay watershed who fails to meet the groundwater-quality-standards tests will have to provide alternate water supplies to the owner of the well.[135]

S.B. 765 reflects both a strong commitment to protecting drinking water within the Chesapeake Bay watershed, as well as a practical monitoring system for groundwater quality standards. If this bill passes, operators of electric power plants, like Dominion, would be required to continue testing all water wells within one mile of their site(s). Given that Dominion has already violated the groundwater quality standards through arsenic pollution, Dominion would presumably have to provide alternate water supplies for owners of wells that have been affected by this contamination.[136] Though S.B. 765 does not address the larger issue of preventing coal ash leachate from wet-settling ponds, it nonetheless offers a reactive solution for individuals and communities suffering from the effects of groundwater pollution from coal ash leachate.

---

132. S.B. 765, 2018 Gen. Assemb., Reg. Sess. (Va. 2018) [hereinafter S.B. 765].
133. U.S. ENVTL. PROT. AGENCY, A CITIZEN'S GUIDE TO CAPPING 1 (2012).
134. S.B. 765, *supra* note 132.
135. *Id.*
136. *Id.*

Second, Senate Bill 766 (S.B. 766) authorizes [VDEQ] to use certain results of citizen water quality testing as evidence in enforcement actions, [which] is currently prohibited.[137] Further, S.B. 766 encourages VDEQ to consider this data, "regardless of whether the data conforms to the requirements set out in the Code of Virginia."[138] This bill would amend § 62.1-44.19:11 of the Code of Virginia, which governs the current citizen water-quality-monitoring program.[139] Under the current program, VDEQ does not have authority to use citizen-monitoring results in any enforcement actions, which include monitoring results from Waterkeepers and Riverkeepers in Chesapeake Bay watershed.[140] The current provision significantly contorts the purpose of citizen water-quality monitoring regimes because Waterkeepers and Riverkeepers—generally "full-time, paid, non-governmental public advocates" and primary spokespersons for the specified water body[141]—are exceptionally well-suited to provide accurate and reproducible water-quality-monitoring results. S.B. 766, however, permits VDEQ to use the results from individuals like Waterkeepers and Riverkeepers.[142]

S.B. 766 emboldens VDEQ's current statutory authority when issuing permits related to water quality. For example, if citizen-monitors had discovered evidence of Dominion's coal ash leachate in the Elizabeth River and Deep Creek before Dominion reported its permit violation, VDEQ could have employed the monitoring results to potentially force Dominion to implement its "corrective action plan" at an earlier date.[143] Similar to S.B. 767, the thrust of S.B. 766 is reactive in nature and does not prevent groundwater pollution discharges. However, S.B. 766 is nonetheless a small step in the right direction. Increased public engagement over water quality standards could conceivably afford members of the public greater agency over the health of their groundwater.

Third, Senate Bill 768 (S.B. 768), in part, prohibits owners or operators of closed coal ash facilities from recovering the costs of capping their

---

137. *SB 766 Citizen Water Quality Monitoring; Use as Evidence in Enforcement Actions*, https://lis.virginia.gov/cgi-bin/legp604.exe?191+sum+SB766 (last visited Mar. 2, 2020); S.B. 766, 2018 Gen. Assemb., Reg. Sess. (Va. 2018).

138. *SB 766 Citizen Water Quality Monitoring; Use as Evidence in Enforcement Actions*, *supra* note 137; S.B. 766, *supra* note 137.

139. VA. CODE ANN. § 62.1-44.19:11 (West 2020).

140. *Id.* ("The results of such citizen monitoring shall not be used as evidence in any enforcement action.").

141. Russell McLendon, *Why Do Rivers Need Riverkeepers?*, MOTHER NATURE NETWORK (May 24, 2018), https://www.mnn.com/earth-matters/wilderness-resources/blogs/riverkeeper-waterkeeper.

142. S.B. 766, *supra* note 137.

143. Sierra Club v. Va. Elec. & Power Co., 903 F.3d 403, 406 (4th Cir. 2018).

contamination.[144] S.B. 768 further directs that "in a biennial review of an investor-owned electric utility by the State Corporation Commission, any costs incurred by an investor-owned electric utility that are associated with closure in place of a coal combustion residuals landfill or surface impoundment are unreasonable and not prudent."[145]

Preventing owners or operators of closed coal ash facilities from recouping the cost of cap-in-place would signal a strong commitment to robust closure standards. In so doing, Virginia would better protect public health and water quality standards.

Stringent facility closure standards are imperative to maintaining healthy water quality because they prevent closed facilities from continuing to leak coal ash and coal ash constituents into the groundwater underlying the respective facility.[146] Under S.B. 768, Dominion would not have been able to recover the costs of its "corrective action plan,"[147] which may have encouraged Dominion to implement more proactive measures concerning the maintenance of its facilities in order to avoid the resulting expense of capping and monitoring.

Last, Senate Bill 807 (S.B. 807), in part, requires existing owners or operators of coal combustion facilities to issue a request for proposal concerning the recycling or beneficial use of the coal combustion waste.[148] S.B. 807 declares that coal ash recycling facilities are in the public interest and would cover construction costs up to $60 million.[149] Recycling coal ash can "replace virgin materials removed from the earth" to create materials such as "concrete and wallboard."[150] In theory, recycling coal ash could thus foster economic growth as opposed to contaminating groundwater. For example, if Dominion constructed coal ash recycling facilities, a proportionate measure of coal ash leachate would have been reused for other materials instead of contaminating the Elizabeth River and Deep Creek. S.B. 807 arguably serves as the strongest measure states like Virginia can take to fill in gaps in the NPDES.

Taken together, Senate Bills 767, 766, 768, and 807—though largely remedial in nature—stand as valuable potential measures Virginia can

144. S.B. 768, 2018 Gen. Assemb., Reg. Sess. (Va. 2018).

145. *Id.*; *SB 768 Electric Utilities; Recovery of Costs Associated with Closure in Place of Coal Ash Facilities,* https://lis.virginia.gov/cgi-bin/legp604.exe?181+sum+SB768 (last visited Mar. 2, 2020).

146. *See, e.g.*, Ken Kingery, *Oxygen Key to Containing Coal Ash Contamination* (Apr. 12, 2016), https://www.sciencedaily.com/releases/2016/04/160412211142.htm (showing selenium and arsenic can leach into groundwater from coal ash disposal sites).

147. *Va. Elec. & Power Co.*, 903 F.3d at 406; S.B. 768, *supra* note 144.

148. S.B. 807, 2018 Gen. Assemb., Reg. Sess. (Va. 2018).

149. *Id.*; *SB 807 Coal Combustion Residuals and Other Units ; Permits, Request for Proposals*, https://lis.virginia.gov/cgi-bin/legp604.exe?181+sum+SB807S (last visited Mar. 2, 2020).

150. *Coal Ash Reuse*, https://www.epa.gov/coalash/coal-ash-reuse (last visited Mar. 2, 2020).

implement to counteract the judicial ambiguity concerning the regulation of groundwater pollution.

CONCLUSION

The Fourth Circuit's decision effectively places hazardous pollutants migrating from groundwater outside the scope of both the CWA and RCRA. Unless an appeal reverses the result-oriented decision of *Virginia Electric & Power Co.*, states like Virginia should implement stricter state legislation concerning coal-combustion waste facilities than what is currently required under federal regulation. The Fourth Circuit's narrow analysis in *Virginia Power & Electric Co.* of coal ash leachate migration from groundwater to nearby surface water produces a contorted outcome that undermines the fundamental purpose and intent of the CWA. Additionally, if the Supreme Court determines, on review of either *Upstate Forever* or *Hawai'i Wildlife Fund*, that the CWA governs groundwater pollution, *Virginia Power & Electric Co.* will be reviewable under this standard.

A favorable Supreme Court holding may determine that natural hydrological functions are means of conveyance of coal ash-derived arsenic from point sources to navigable waters. Under such interpretation, the EPA and states authorized to administer § 404 permits would thus have fundamental regulatory authority to implement stricter NPDES permits. In the interim, however, Virginia and similarly situated states should enact state legislation to fill in the aforementioned CWA gaps in groundwater pollution.

JUDICIAL REVIEW ON THE VALIDITY OF CONTRACT CONCERNING NATURAL RESOURCES EXPLOITATION AND UTILIZATION IN SPECIAL REGIONS

ZHU Jing[1]

1. Judge ZHU Jing (朱婧), Ph.D. of law, sitting judge of the Environment and Resources Division, Supreme People's Court, People's Republic of China.

INTRODUCTION

When the idea of ecological civilization[2] and green development[3] became part of China's national strategy, the issue of illegal exploitation and utilization of natural resources in nature reserves and other special regions also became a public concern. In China, natural resources exploitation and utilization is subject to administrative examination and approval.[4] However, sometimes illegal development activities are not deterred or corrected because the local government wants to protect the regional economy.[5] This problem has given rise to operations of illegal mines in ecologically sensitive areas that are under strict protection, especially in western remote parts of China, where mineral resources are rich. In some cases, the mines have obtained permits duly issued by the relevant government agencies even though they are prohibited in the protected areas by law.

---

2. Ecological civilization is a concept of building a civilization based on an industrial structure with a growth and consumption pattern that conserves energy resources and protects the environment. In November 2012, the 18th National Congress of the Chinese Communist Party promoted the construction of ecological civilization to the same strategic height as economic construction, political construction, cultural construction, and social construction. In September 2015, China issued Shengtai Wenming Tizhi Gaige Zongti Fangan (生态文明体制改革总体方案) [The Overall Plan for the Reform of Ecological Civilization System], stipulating the goal, ideas, and measures of China's ecological civilization system reform. *Zhongguo Gongbu Shengtai Wenming Tizhi Gaige Zongti Fangan* (*中国公布生态文明体制改革总体方案*) [*China Announces the Overall Plan for the Reform of Ecological Civilization System*], XINHUA NEWS (Sep. 21, 2015), http://www.xinhuanet.com/politics/2015-09/21/c_1116632281.htm.

3. Green development is a new model of development based on the restriction of ecological and resource carrying capacity, which takes environmental protection as an important pillar of sustainable development. In March 2016, the National People's Congress (NPC) approved the Outline of the13th Five-year Plan for National Economic and Social Development of China (2016-2020), which included green development as one of the five major development ideas, along with innovative development, coordinated development, open development and shared development. Zhonghua Renmin Gonghe Guo Guomin Jingji he Shehui Fanzhan di Shisan ge Wu Nian Guihua Gangyao (中华人民共和国国民经济和社会发展第十三个五年规划纲要) [13th Five-year Plan for Nat'l Econ. & Social Dev.] (approved by the NPC Mar. 16, 2016).

4. *See* Admin. Licensing Law (行政许可法) (promulgated by the Standing Comm. of the Nat'l People's Cong., Aug. 27, 2003, effective Jul. 1, 2004).

5. LI Biao (李彪), *Huanbao Buzhang: Duli Jinxing Huanjing Jianguan he Xingzheng Zhifa* (*环保部长:独立进行环境监管和行政执法*) [*Independent Envt'l Supervision and Admin. Law Enforcement to Break Local Protection*], NAT'L BUS. DAILY (Feb. 11, 2014), http://www.nbd.com.cn/articles/2014-02-11/808058.html.

One such case made its way to the Supreme People's Court (SPC), raising questions of first impression—whether an environmental regulation prohibiting mining activities in a nature reserve in the Xinjiang Uygur Autonomous Region (Xinjiang) can serve as a basis to invalidate a contract to conduct mining activities within the reserve and whether the contract can be invalidated if it is found to contravene the public interest in environmental and resource protection.[6] In the *Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.* case, the SPC held for the first time that, indeed, the violation of a mandatory prohibition of an environmental regulation could invalidate the contract, and that violation of environmental public interest likewise could also be cause to invalidate the contract.[7] As a result of this case, the SPC promulgated a Judicial Interpretation, which serves as a source of law,[8] stating that in the narrow context where a contract to explore and exploit mineral resources in specific protection regions violates a mandatory provision of law or regulation or environmental public interest, it is deemed null and void.[9]

While the interpretation was narrowly worded, this article argues that the *Jinhe* holding and SPC Judicial Interpretation have made environmental public interest an important interest, the violation of which would render a civil act of entering into a contract invalid. This elevation of environmental public interest was influenced by the promulgation of the General Principles of Civil Law, which for the first time require that civil subjects engaging in civil acts under the law must do so contributing to the principles of environmental protection and conservation.

In Chinese civil law theory, not every violation of a mandatory provision of law renders a civil act or a contract invalid. Only mandatory provisions affecting the validity of the civil act or the contract may render it invalid if they were violated. Scholars have argued that environmental law as a public law is not the type of law that affects the validity of a civil act. Under the reasoning in the *Jinhe* case, this article argues that mandatory provisions of

---

6. Sichuan Jinhe Kuangye Youxian Gongsi Su Xinjiang Lingang Ziyuan Touzi Gufen Youxian Gongsi (四川金核矿业有限公司诉新疆临钢资源投资股份有限公司) [Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.], 2017 SUP. PEOPLE'S CT. GAZ. 34 (Sup. People's Ct. 2017) (China).

7. *Id.* at 41.

8. Cases in China do not have "'stare decisis-like' authority." Mark Jia, Note, *Chinese Common Law? Guiding Cases and Judicial Reform*, 129 HARV. L. REV. 2213, 2214 (2016); *cf.* SPC Provisions on Judicial Interpretation, *infra* note 66 (noting that judicial interpretations are a formal source of law).

9. Zuigao Renmin Fayuan Guanyu Shenli Kuangye Jiufen Anjian Shiyong Falu Ruogan Wenti de Jieshi (最高人民法院关于审理矿业纠纷案件适用法律若干问题的解释) [SPC Judicial Interpretation on Application of Law in Mining Right Disputes] (promulgated by the Trial Comm. of Sup. People's Ct. Feb. 20, 2107, effective Jul. 27, 2017) art. 18.

environmental law can affect the validity or effectiveness of a civil act in such a way that a violation of the provisions could render the act invalid.

The *Jinhe* case highlighted the problem of illegal mines in nature reserves and ecologically sensitive areas where the local governments have failed to enforce the law or have given permission to such illegal activities. The *Jinhe* holding and the subsequent Judicial Interpretation have provided courts with the legal basis to address the problem by invalidating exploitation and utilization contracts. They give the judiciary an important role to play in correcting the lack of administrative enforcement of environmental laws.

Parts 0 and 0 of this article discuss the background of the nature reserve at issue and the litigation before the Xinjiang High People's Court. Part 0 discusses the SPC decision and Part 0 analyzes the General Principles of Civil Law and the Green Principle that they establish, requiring civil subjects to engage in civil actions that would contribute to natural resources conservation and environmental protection. The Green Principle has made environmental public interest relevant and, indeed, a required consideration in reviewing the validity of one's civil acts.

Part 0 explains the type of mandatory provisions of laws and administrative regulations,[10] the violation of which may serve as a basis for invalidating a civil act or a contract. Under Chinese civil law theory, mandatory provisions of law are categorized as mandatory provisions of effectiveness—affecting the effectiveness or validity of an act—or mandatory provisions of management—regulating the act but not affecting its effectiveness or validity. This Part analyzes and argues that compulsory prohibitions in environmental laws and regulations can be categorized as mandatory provisions of effectiveness. Part 0 discusses the elevation of environmental public interest as an important interest the violation of which could have an impact on the validity of contracts. Part 0 discusses the correcting function of environmental and natural resources judicial bodies. It first describes the dilemma between economic development and environmental protection and limitation of administrative law enforcement mechanisms to correct violations of environmental laws in cases involving resource exploration and exploitation in special regions. It then demonstrates how the judiciary can play an important role in reviewing resource-development contracts in such cases and in correcting any limitation in the administrative enforcement of environmental laws.

---

10. Laws and administrative regulations are both formal sources of law in China. Laws are legislated and adopted by the National People's Congress, while administrative regulations are legislated and adopted by the State Council. *See* SUN GUOHUA & ZHU JINGWEN (孙国华&朱景文), FALI XUE (法理学) [JURISPRUDENCE] 231–32 (3d ed. 2009).

I. BACKGROUND

In December 2010, China's State Council, its highest governmental organ, issued the National Main Functional Area Plan, directing all provinces and autonomous regions to survey and categorize land within their borders as optimized development regions, key development regions, restricted development regions, or prohibited development regions according to their resource carrying capacity, ecological functions, existing development strength, and development potential.[11] Under the Plan, national nature reserves, world cultural or natural heritage sites, national scenic areas, and national forests and parks are designated as national-level prohibited development regions.[12] On the provincial level and lower, natural and cultural resource protection areas and important water sources are also categorized as prohibited development regions.[13] These "special regions," which include nature reserves, scenic areas, key ecological function areas, environmentally sensitive areas, and ecologically vulnerable areas, are subject to protection and have special restrictions on their development and utilization. National and provincial governments were required to adopt and implement policies, laws, and regulations to protect these special regions. Specifically, for nature reserves, the State Council promulgated the Nature Reserves Regulations prohibiting the mining, grazing, hunting, fishing, gathering medicinal herbs, burning, and other activities in nature reserves.[14]

The Taxkorgan Nature Reserve, which spans about 15,000 square kilometers, is located in the Taxkorgan Tajik Autonomous County in southwest Xinjiang.[15] The nature reserve is located on the high Pamir Plateau, bordering Afghanistan, Tajikistan, and Pakistan.[16] It is home to many species of plants and animals.[17] The Xinjiang government established

---

11. Quanguo Zhuti Gongneng Qu Guihua (全国主体功能区规划) [Nat'l Main Function Areas Plan] (promulgated by the State Council Dec. 21, 2010), chs. 2, 13.

12. *Id.* ch. 2.

13. *Id.*

14. Ziran Baohu Qu Tiaoli (自然保护区条例) [Nature Reserves Regulations] (promulgated by the St. Council, Sept. 2, 1994, revised Jan. 1, 2011 and Oct. 7, 2017), art. 26.

15. BAI Jiali & LI Jing (白佳丽&李京), *Xinjiang: Feifa Jue Kuang Tuichu Pamir* (*新疆:非法倔矿退出帕米尔*) [*Xinjiang: Illegal Mines Pushed Out of Pamir*], XINHUA NEWS (Jul. 15, 2019), http://m.xinhuanet.com/2019-07/15/c_1124755833.htm.

16. *Id.*; *see also* CHEN Qiangqiang (陈强强), et al., *Xinjiang Taxkorgan Yesheng Dongwu Ziran Baohuqu Makeboluo Panyang Qiangzai Shengtai Langdao Shibie* (*新疆塔什库尔干野生动物自然保护区马可波罗盘羊潜在生态廊道识别*) *[Identification of Potential Ecological Corridors for Marco Polo Sheep in Taxkorgan Wildlife Nature Reserve, Xinjiang, China]*, 27 BIODIVERSITY SCI. 186, 188 (2017).

17. CHEN, et al., *supra* note 16.

it to protect the habitat of the state-protected Marco Polo sheep, which is a subspecies of the argali sheep, in 1984, long before the National Main Functional Area Plan was issued.[18]

The Xinjiang government promulgated the Xinjiang Environmental Protection Regulations in 1996 that prohibited the construction of pollution generating industrial production facilities in nature reserves, scenic areas, cultural relic protection areas, and other areas that have been designated for protection.[19] In 2011, subsequent to the issuance of the National Main Functional Area Plan, Xinjiang amended the regulations to explicitly prohibit any resource exploration and development in nature reserves, scenic areas, and drinking water sources, among others.[20]

China's western region where the Taxkorgan Nature Reserve is located has a rich reserve of minerals.[21] Because of this and the poor economy in the region, local authorities once permitted the development of mines to power local economic growth and issued some mining permits in the region, including in the Taxkorgan Nature Reserve,[22] even though the national Nature Reserves Regulations and the Xinjiang Environmental Protection Regulations specially prohibit mining in nature reserves.

Despite this prohibition, the plaintiff in the case, *Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.*, had obtained a mining permit

---

18. *Id*; *China Strengthens Efforts to Protect Marco Polo Sheep*, XINHUA NEWS (Jul. 1, 2019), http://www.xinhuanet.com/english/2019-07/01/c_138189210.htm. State-protected animals are designated under the Wildlife Protection Law for protection. The hunting, catching, or killing of such wild animals, except in certain circumstances and only if the necessary license is obtained, is prohibited. Yesheng Dongwu Baohu Fa (野生动物保护法) [Wildlife Protection Law] (promulgated by the Standing Comm. Nat'l People's Cong., Nov. 8, 1988, revised Jul. 2, 2016, effective Jan. 1, 2017), art. 21.

19. Xinjiang Weiwuer Zizhiqu Huanjing Baohu Tiaoli (新疆维吾尔自治区环境保护条例) [Xinjiang Environmental Protection Regulations] (promulgated by the Xinjiang People's Cong. Jul. 26, 1996), art. 24.

20. Xinjiang Weiwuer Zizhiqu Huanjing Baohu Tiaoli (新疆维吾尔自治区环境保护条例) [Xinjiang Environmental Protection Regulations] (revised by Xinjiang People's Cong. Dec. 1, 2011, effective Feb. 1, 2012), art. 23. Xinjiang also has promulgated regulations for the management of nature reserves. Xinjiang Weiwuer Zizhiqu Ziran Baohu Qu Guanli Tiaoli (新疆维吾尔自治区自然保护区管理条例) [Xinjiang Nature Reserves Management Regulations] (promulgated by the Xinjiang People's Cong., Jan. 22, 1997), art. 12 (dividing nature reserves into core areas, buffer zones and experimental areas for management purposes). In 2018, the Xinjiang government amended these regulations to include a provision that all nature reserves must be regulated and managed in compliance with the national Nature Reserves Regulations, *supra* note 14, thus incorporating the prohibition on mining in nature reserves. Xinjiang Nature Reserves Management Regulations (revised and effective Sept. 21, 2018), art. 12.

21. *Illegal Mines Phased Out in Nature Reserve on Pamir Plateau* (Jul. 15, 2019), http://www.chinadaily.com.cn/a/201907/15/WS5d2c27f3a3105895c2e7d817.html; MINISTRY OF LAND AND RESOURCES, CHINA MINERAL RESOURCES 14–15 (2016); MINISTRY OF LAND AND RESOURCES, CHINA MINERAL RESOURCES 7–12 (2018).

22. *Illegal Mines Phased Out in Nature Reserve on Pamir Plateau*, *supra* note 21; BAI, *supra* note 15.

in December 2008 from the Xinjiang Department of Land and Resources for a polymetallic mine measuring approximately 31.28 square kilometers (the Uruke mine) located within the Taxkorgan Nature Reserve.[23] This case raised the issue of whether a contract to explore and exploit mineral resources at a mine pursuant to a duly issued permit is valid at its inception and, therefore, enforceable.

II. THE LITIGATION

In October 2011, the plaintiff, Sichuan Jinhe Mining Co. Ltd. (Jinhe), and the defendant, Lingang Resources Investment Co. Ltd. (Lingang), entered into a contract to jointly establish a company to cooperatively explore and exploit mineral resources at the Uruke mine.[24] Under the contract, Jinhe agreed to transfer its mineral mining rights at the Uruke mine to the company while Lingang agreed to pay Jinhe CNY 35 million and to provide the capital in conducting the exploration and exploitation of minerals at the mine.[25]

In entering into the contract, Jinhe represented that it had duly obtained a mining permit to engage in mineral exploration and exploitation and surveying operations in the Uruke mine.[26] Jinhe agreed to maintain the validity of the mining rights, including obtaining the necessary permit extensions and complying with permit requirements.[27] Jinhe also guaranteed that the Uruke mine was not located within any glaciers, nature reserves, scenic areas, or other areas, which would negatively affect mining development.[28]

After the execution of the contract, Lingang paid Jinhe CNY 35 million.[29] In April 2012, Lingang entered into a contract with a third party to begin exploration work at the mine.[30] In April 2013, Jinhe obtained an extension of the mining permit to enable the exploration work to continue.[31] The exploration work appeared to have been ongoing throughout this time

23. Sichuan Jinhe Kuangye Youxian Gongsi Su Xinjiang Lingang Ziyuan Touzi Gufen Youxian Gongsi (四川金核矿业有限公司诉新疆临钢资源投资股份有限公司) [Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.], 2017 SUP. PEOPLE'S CT. GAZ. 35 (Sup. People's Ct. 2017) (China).
24. *Id.* at 34–35.
25. *Id.* at 35.
26. *Id.*
27. *Id.*
28. *Id.*
29. *Id.*
30. *Id.* at 35–36.
31. *Id.* at 36.

period.[32] The mining company that the parties agreed to set up was formally established in July 2013.[33]

In November 2013, Lingang sent a letter to Jinhe to terminate the contract, claiming that it had recently learned that the Uruke mine was located within the Xinjiang Taxkorgan Nature Reserve.[34] It claimed that Jinhe's failure to inform Lingang of this fact was a breach of the contract and was cause for its termination.[35] In December 2013, the Xinjiang Taxkorgan Nature Reserve Administration issued a certificate confirming that, based on the information provided by Jinhe, the Uruke mine was indeed located in the nature reserve.[36] In response, Jinhe acknowledged that the Taxkorgan Nature Reserve had been established long before Jinhe obtained its mining permit in December 2008.[37] However, it claimed that it had no knowledge that the Uruke mine was located within the reserve.[38] It further claimed that, since it had obtained the permit, the Department of Land and Resources had conducted annual inspections of the mining area; Jinhe had obtained extensions of the permit on two separate occasions; and, during this entire period, neither the Department of Land and Resources nor any of the other relevant departments or agencies had ever informed Jinhe that the mine was located within the nature reserve.[39] Jinhe argued that there was no breach of contract and the parties should continue to perform under the contract because the permit was duly issued by the relevant government agency, no government agencies had banned any of the work specified under the contract, and both parties had been performing diligently under the contract for more than two years.[40]

Jinhe subsequently filed suit in Xinjiang People's High Court to seek a judgment declaring that Lingang may not terminate the contract and seek specific performance of the contract.[41] Lingang countersued, claiming that Jinhe had misrepresented that the mine was not located in "glacier protection area, nature reserve, or scenic area" and that such misrepresentation constituted a breach of the contract.[42] Lingang sought to terminate the contract and recoup the CNY 35 million it had paid Jinhe under the contract,

32. *Id.*
33. *Id.*
34. *Id.*
35. *Id.*
36. *Id.*
37. *Id.*
38. *Id.*
39. *Id.* at 36–37.
40. *Id.*
41. *Id.* at 37.
42. *Id.*

as well as expenses that it had incurred in conducting the exploration and survey work at the mine.[43]

The Xinjiang High People's Court ruled in favor of Jinhe. It held that the contract was legal and binding between the parties as it expressed the genuine intention of the parties—to collaborate to explore and exploit mineral resources at the Uruke mine.[44] Even though mining was not permitted in the Taxkorgan Nature Reserve under both the national and local regulations in effect, the Xinjiang High People's Court held that the contract did not violate any mandatory prohibitions of laws or regulations.[45] Specifically, the court cited to the Mineral Resource Law, which regulates the mining industry requiring that all mines obtain the necessary approvals.[46] Since Jinhe had obtained a mining permit, the court found that there was no violation of a mandatory provision of law.[47] Turning to the question of whether Lingang could terminate the contract, the court found that since the fact that the mine was located in a nature reserve was public information, both parties knew or should have known this fact.[48] The court further found that Lingang had not objected and had in fact performed its obligations for two and one half years and concluded that there was no serious breach warranting termination of the contract.[49] Lingang appealed. On November 14, 2015, the SPC reversed the Xinjiang High People's Court and ruled in Lingang's favor.[50]

III. THE SPC INVALIDATES A CONTRACT THAT VIOLATES ENVIRONMENTAL REGULATIONS AND PUBLIC INTEREST.

The issues on appeal were (1) whether Lingang could terminate the contract; and (2) whether Lingang was entitled to recoup the contract price of CNY 35 million and the expenses it had incurred in performing the contract.[51] The SPC affirmed the findings of the fact of the Xinjiang High People's Court, but held that the lower court erred in the application of law.[52] The SPC ruled that the contract was not valid at its inception, which obviated

43. *Id.*
44. *Id.* at 38.
45. *Id.*
46. *Id.* (referencing Kuangchan Ziyuan Fa (矿产资源法) [Mineral Resource Law] (promulgated by the Standing Comm., Nat'l People's Cong., Mar. 19, 1986, revised and effective Aug. 27, 2009)).
47. *Id.*
48. *Id.* at 38–39.
49. *Id.*
50. *Id.* at 39–42.
51. *Id.* at 41.
52. *Id.* at 42.

the need to determine whether Lingang could terminate the contract based on the alleged breach.[53]

In invalidating the contract, the SPC pointed to Article 52 of China's Contract Law, which provides that a contract "shall be deemed null and void if it . . . damages the public interest [or] violates a mandatory provision of law or administrative regulation."[54] It found that because mining in a nature reserve is explicitly prohibited under Article 26 of the national Nature Reserves Regulations, the contract, the purpose of which was to explore and exploit mineral resources in the Taxkorgan Nature Reserve, violated a compulsory prohibition under the regulations promulgated by the State Council and should be deemed null and void.[55] The SPC further found that "[i]f the contract were deemed valid and its performance permitted to continue, it would cause serious damage to the environment and ecology of the nature reserve and would damage the environmental public interest."[56] Therefore, the SPC held that the contract was invalid.[57] It ordered Jinhe to refund Lingang the contract price of CNY 35 million and CNY 2.5 million in expenses, which Lingang had incurred in building a road in the mining area as part of the exploration work.[58]

The *Jinhe* holding established for the first time that a contract to explore and exploit mineral resources in a special region may be voided if its performance would violate an environmental regulation and that the interest to protect the environment and natural resources is a public interest, the violation of which warrants the invalidation of a contract under China's Contract Law.[59] Although cases in China, which is a civil law country, do not have precedential value,[60] the holding in the *Jinhe* case took on more significance when, in July 2016, the SPC identified it as one of ten model or typical cases addressing civil disputes involving mining rights.[61]

---

53. *Id.* at 41.

54. *Id.*(citing Hetong Fa (合同法) [Contract Law] (promulgated by the Nat'l People's Cong. Mar. 15, 1999, effective Oct. 1, 1999), art. 52(4)–(5)).

55. *Id.*

56. *Id.*

57. *Id.*

58. *Id.* The SPC denied Lingang's claims for other expenses and interests. *Id.* at 41–42.

59. *Id.* at 34.

60. Jia, *supra* note 8, at 2214.

61. *Zuigao Renmin Fayuan Fabu Shi Qi Shenli Kuangye Quan Minshi Jiufen Anjian Dianxing Anli* (*最高人民法院发布十起审理矿业权民事纠纷案件典型案例*) [*SPC Ten Model Cases on Mining Rights Disputes*] (Jul. 12, 2016), http://pkulaw.cn/case_es/pal_a3ecfd5d734f711d79b3cc12d9bef407160f05e14be63a1fbdfb.html?match=Exact (announcing the selection of the *Jinhe* case as a typical case). Since 1985, the SPC has a practice of issuing model or typical cases to provide nonbinding guidance to lower court judges on "the correct application of well-established doctrine." Jia, *supra* note 8, at 2216–17.

As a typical case, the *Jinhe* holding provides lower courts with an indication of how certain legal issues should be resolved in similar cases.[62] In designating *Jinhe* as a typical case, the SPC recognized that conflicts often arise between the need for development and the need to protect the environment and natural resources, particularly in special regions that are rich in resources but are designated for protection because of their biodiversity and ecological importance.[63] In disputes involving the development of special regions, such as nature reserves, scenic spots, key ecological function areas, and other ecologically sensitive areas, the SPC stresses that courts must take into consideration the ecological functions of these regions in accordance with the development plans established by the national government or relevant provincial governments.[64] Courts should consider these issues in reviewing the validity of the contract to determine whether it violates any mandatory provisions of law or whether it harms the public interest, even if the parties have obtained approvals from the relevant governmental agencies to proceed with the contracted work.[65]

The significance of the *Jinhe* holding was solidified seven months later when the SPC issued a Judicial Interpretation on the Application of Law in Mining Rights Disputes (Judicial Interpretation on Mining Rights Disputes), establishing the standard of judicial review in such cases.[66] Absorbing the rules established by the *Jinhe* case, the SPC Judicial Interpretation provides as follows:

> A contract signed by the parties to explore and exploit mineral resources in special regions, such as nature reserves, scenic areas,

---

62. Even though typical cases do not provide binding authority, one scholar observes that, in practice, these cases have become a "type of soft precedent" that legal professionals, including judges, prosecutors and lawyers, have made use of in support of their positions and arguments in court. Susan Finder, *China's Evolving Case Law System in Practice*, 9 TSINGHUA CHINA L. REV. 245, 246, 247–55 (2017).

63. *SPC Ten Model Cases on Mining Rights Disputes*, *supra* note 61.

64. *Id.*

65. *Id.*

66. Judicial Interpretations are a formal source of law in China. *See* Zuigao Renmin Fayuan Guanyu Sifa Jieshi Gongzuo de Guiding (最高人民法院关于司法解释工作的规定) [SPC Provisions on Judicial Interpretation] (promulgated by the Trial Comm. of the Sup. People's Ct. Mar. 9, 2007, effective Apr. 1, 2007) (establishing the procedures for the SPC to issue judicial interpretations governing the application of law in adjudication by the people's courts). Article 5 gives the interpretations duly issued pursuant to these procedures the full force of law, and Article 27 requires courts to cite to where in its ruling the interpretation serves as basis for a ruling. The procedures for promulgating a judicial interpretation are quite involved, requiring a detailed planning process, research and investigation, and coordination and comments from other relevant departments, including the National People's Congress, China's national legislature. Thus, judicial interpretations are not in the form of case law and are not based on facts in individual cases, but rather are a set of written law abstracted from judicial practice and which govern how cases are adjudicated. *See* SUN, *supra* note 10, at 239.

> key ecological function areas, environmentally sensitive areas and vulnerable ecological areas, shall be deemed null and void if it violates mandatory provisions of the law and administrative regulation, or if it injures the environmental public interest.[67]

The importance of the *Jinhe* case and the subsequent Judicial Interpretation must be understood in light of the Green Principle of the Civil Code, which had been under consideration during the *Jinhe* litigation and was finally adopted at around the same time the SPC issued the Judicial Interpretation on Mining Rights Disputes.

IV. THE ELEVATION OF ENVIRONMENTAL PUBLIC INTEREST IN THE REVIEW OF VALIDITY OF CONTRACT EMBODIED IN THE JUDICIAL INTERPRETATION ON MINING RIGHTS DISPUTES WAS SIGNIFICANTLY INFLUENCED BY THE GREEN PRINCIPLE OF CHINA'S CIVIL CODE.

Before China adopted the Green Principle of the Civil Code, judges generally did not consider or apply environmental laws in hearing cases under civil law governing private actions, because environmental laws have public law attributes.[68] Contracts that violate environmental laws may still be protected by the court even though the performance of these contracts might damage ecology and the environment simply because they are genuinely agreed to by the parties.[69] With the promulgation of the Green Principle of the Civil Code, which would govern all civil activity, including entering into a contract, judges are required to apply laws in a systematic and complete way in order to ensure private actions comply with the requirements of green development.[70]

---

67. SPC Judicial Interpretations on Mining Rights Disputes, *supra* note 9, art. 18.

68. SPC ENVIRONMENT AND RESOURCES DIVISION, ZUIGAO RENMIN FAYUAN KUANGYE QUAN SIFA JIESHI LIJIE YU SHIYONG (最高人民法院矿业权司法解释理解与适用) [UNDERSTANDING AND APPLICATION OF SPC JUDICIAL INTERPRETATION ON MINING RIGHTS] 234–35 (2018).

69. *Id.*

70. SUN Jie (孙洁), *LV Zhongmei: Minfa Zongze Ying Tixian Lv se Fazhan Linian* (*吕忠梅:民法总则应体现绿色发展理念*) [*LV Zhongmei: The General Principles of Civil Law* S*hould Embody the Idea of Green Development*], DEMOCRACY AND LEGISLATION J. (Mar. 20, 2017), https://chuansongme.com/n/1688267752917.

A. The Establishment of the Green Principle of the Civil Code

After 40 years of the market economy reform and opening practice to the outside world, China has formed a relatively complete and mature civil law system.[71] However, China still lacks a uniform civil code, resulting in difficulties in understanding and applying all the specific civil laws, and resolving conflicts between them in some occasions.[72] The Xi Jinping Government has made considerable progress in creating this civil code since 2014.[73] In March 2017, the National People's Congress adopted the General Principles of Civil Law.[74]

Scholars refer to the General Principles of Civil Law as the "Green Civil Code."[75] Article 9 of the General Principles, which establishes the Green Principle, prominently manifests concern over the environment by providing that "parties to civil relations shall conduct civil activities contributing to the conservation of resources and the protection of the environment."[76] Natural resources conservation and ecological environmental protection is henceforth not only the task of environmental law, but also a fundamental principle of civil law.[77]

This Principle not only inherits the Chinese traditional cultural idea of harmony among heaven and earth, and man and nature, but also has the distinctive characteristics of the time in which it was written.[78] The Green

---

71. LI SHISHI (李适时), ZHONGHUA RENMIN GONGHE GUO MINFA ZONGZE SHIYI (中华人民共和国民法总则释义) [PARAPHRASE OF THE GENERAL PRINCIPLES OF CIVIL LAW] 1 (2017).

72. WANG LIMING (王利明), MINFA DIAN TIXI YANJIU (民法典体系研究) [STUDIES ON CIVIL CODE SYSTEM] 21–24 (2d ed. 2012).

73. YANG Weihan (杨维汉) et al., *Wei Shixiang Zhongguo Mong Dianding Jianshi de Fazhi Jishi (为实现中国梦奠定坚实的法治基石)* [*Laying a Solid Foundation for Developing the Rule of Law to Fulfill the Chinese Dream*], XINHUA NEWS (Mar. 16, 2017), http://www.xinhuanet.com/politics/2017lh/2017-03/16/c_1120635182.htm.

74. MINFA ZONGZE (民法总则) [GENERAL PRINCIPLES OF CIVIL LAW] (promulgated by the Nat'l People's Cong. Mar. 15, 2017, effective Oct. 1, 2017). The government planned to complete the compilation of the sub-series of the civil code by 2020. The sub-series will then be merged with the General Principles of Civil Law to form a unified civil code. *See* LI, *supra* note 71, at 4.

75. XU Guodong (徐国栋), *Lvse Minfadian: Quanshi Minfa Shengtai Zhuyi (绿色民法典:诠释民法生态主义)* [*Green Civil Code: Interpretation of Civil Ecologism*], CHINA ENVTL. NEWS (Apr. 5, 2004), http://news.sina.com.cn/c/2004-04-05/09292227897s.shtml.

76. MINFA, *supra* note 74, art. 9.

77. *See generally* LV Zhongmei (吕忠梅), *Lvse Yuanze Zai Minfadian Zhong de Guanche Lungang* (*绿色原则在民法典中的贯彻论纲*) [*Outline of the Implementation of the Green Principle in The Civil Code*], CHINESE LEGAL SCIENCE 5 (2018) (describing environmental protection principles in the civil code).

78. *See* LI, *supra* note 71, at 32.

Principle reflects the new national strategy of green and sustainable development. It addresses the national conditions that China, with such a large population, must properly solve: the conflict between human beings and natural resources.[79] Furthermore, the Green Principle encapsulates the spirit of all existing environmental protection laws. Natural resources conservation and ecological environmental protection are embedded and required by China's Constitution and many laws. For example, Article 9 of the Constitution stipulates that the state should ensure the rational use of natural resources, protect rare animals and plants, and prohibit any person from occupying or destroying natural resources by any means.[80] Article 6 of Environmental Protection Law provides that all persons have the obligation to protect the environment.[81] Specifically, producers and operators shall prevent and reduce environmental pollution and ecological destruction, and shall be responsible for the damage caused thereby.[82] Chapter 8 of Tort Law specifically regulates the civil liability of environmental pollution, stipulating the rules of multiple polluters infringement, reversal of burden of proof, and fault of the third person.[83] Given these extensive rights and obligations under Chinese environmental law, the Green Principle is expected to wield great influence over private conduct.

B. Influence of the Green Principle on the Validity of Contract

The Green Principle has important value orientation in China. First, it demands that the legislature take natural resources conservation and ecological environmental protection as a significant consideration in regulating civil activities.[84] Second, civil subjects, including natural persons, legal persons, and unincorporated organizations, must act in accordance with the ideas of saving natural resources and protecting the ecological

79. *Id.*

80. XIANFA art. 9 (2018) (China).

81. Huanjing Baohu Fa (环境保护法) [Envt'l Protection Law] (promulgated by the Standing Comm. of the Nat'l People's Cong. Dec. 26, 1989, revised Apr. 24, 2014, effective Jan. 1, 2015), art. 6.

82. *Id.*

83. Qinquan Zeren Fa (侵权责任法) [Tort Law] (promulgated by the Standing Comm. of the Nat'l People's Cong. Dec. 26, 2009, effective Jul. 1, 2010), art. 67 ("If more than two polluters pollute the environment, the responsibility of each polluter shall be determined according to the kinds of pollutants and the amount of discharge and other factors."); art. 66 ("In the event of disputes over environmental pollution, the polluter shall bear the burden of proof that there is a statutory exemption and mitigation of responsibility or there is no causation between the act and the injury."); art. 68 ("Where the environmental pollution was caused by the third person's fault, the infringed may claim compensation from the polluter, or may claim compensation from the third party. The polluter shall have the right to recover the claim from the third party after the compensation has been paid to the infringed.").

84. *See* LI, *supra* note 71, at 32.

environment when engaging in private conduct.[85] Third, the judiciary must protect behaviors that save natural resources and safeguard the ecological environment, while condemning activities that do otherwise.[86] When hearing cases, the judges may make judgments on the ground of the Green Principle, provided that there are no specific laws applicable to the case.[87] Thus, the Green Principle elevates environmental protection as an important public interest. The SPC Judicial Interpretation on Mining Rights Disputes specifically incorporates environmental public interest as a public interest that can serve as a basis to invalidate a contract.

V. THE VIOLATION OF MANDATORY PROVISIONS OF ENVIRONMENTAL AND NATURAL RESOURCES LAWS AND ADMINISTRATIVE REGULATIONS CAN BE A BASIS FOR INVALIDATING A CONTRACT.

The rules established in the *Jinhe* case and the subsequent Judicial Interpretation seem straightforward in light of Article 52 of China's Contract Law, which already provides that a contract "shall be deemed null and void if it . . . damages the public interest [or] violates a mandatory provision of law or administrative regulation."[88] However, whether an environmental law can form the basis for invalidating a resource development and utilization contract and result in the cessation of illegal exploitation of mineral resources in a special region is debatable and somewhat controversial in practice.[89] This is because the current Contract Law favors the fostering of transactions and disfavors the invalidation of a contract that expresses the intent of the parties.

China's current Contract Law was the result of a major revision in 1999 that sought to resolve redundancies and inconsistencies of previous versions of contract laws and to guide the regulation of China's rapidly growing market economy.[90] It has established three key guiding principles—the principle of freedom of contract, the principle of good faith, and the principle of fostering transaction.[91] As the country moved away from "intense

85. *Id.*
86. *Id.*
87. *See* SUN, *supra* note 70.
88. Hetong Fa (合同法) [Contract Law] (promulgated by the Nat'l People's Cong. Mar. 15, 1999, effective Oct. 1, 1999), art. 52(4)–(5).
89. ZHU Jing (朱婧), *Teshu Quyu She Kuang Hetong de Xiaoli Shencha,* (*特殊区域涉矿合同的效力审查*) [*Review of the Validity of Mining Contracts in Special Regions*], PEOPLE'S COURT JOURNAL (Feb. 15, 2017), http://www.dcnnlawyer.com/html/mszh/4531.html.
90. WANG Liming & XU Chuanxi, *Fundamental Principles of China's Contract Law*, 13 COLUMBIA J. ASIAN L. 1, 5–7 (1999).
91. *Id.* at 9–33.

centralized planning and the elimination of freedom of contracts," the law adopted an expansion of freedom of a party to form contracts with others and determine the terms.[92] This principle was needed also to foster transaction in order to build China's market economy.[93] Thus, the Contract Law specifically prohibits illegal interference with the rights of a party to enter in a contract.[94] Article 52 of the Contract Law limits this expansion to ensure that contracts are not violative of the law or public interest.[95]

Not all violations of law or regulation can serve as a basis for invalidating a contract under Article 52, however. It must be a violation of a mandatory provision of law or regulation.[96] The SPC explained that the mandatory provision in Article 52 of the Contract Law refers to the mandatory provision relating to the validity or effectiveness of the contract.[97]

Scholars and judges have interpreted the mandatory provisions of law and administrative regulation under Article 52 to be divided into mandatory provisions of effectiveness and mandatory provisions of management.[98] Mandatory provisions of management aim to carry out administrative management and penalize the illegal acts, but they do not determine the validity of a contract.[99] Violating these provisions will subject the parties to administrative or criminal sanctions, without affecting the validity of the contract.[100] On the other hand, violating mandatory provisions of effectiveness will negatively affect the validity of the private conduct.[101]

In 2016, the SPC affirmed this interpretation in a notice to lower courts that in applying Article 52 in commercial cases, they must pay attention to the distinction between a mandatory provision relating to the effectiveness or validity of an act and mandatory provision relating to the management or regulation of the act and that they "must strictly limit the scope of

---

92. *Id.*at 10.

93. *Id.*

94. Contract Law, *supra* note 88, art. 4.

95. *Id.* art. 52(4)–(5). Article 52 of the Contract Law also provides that a contract is null and void if it results from fraud or coercion, or malicious collusion, or is formed for an illegal purpose. *Id.* art. 52(1)–(3).

96. *Id.* art. 52(5); *see also* WANG & XU, *supra* note 90, at 26 (arguing that only violations of mandatory provisions of national laws and regulations may be a basis for voiding a contract).

97. Zuigao Renmin Fayuan Guanyu Shiyong "Zhonghua Renmin Gonghe Guo Hetong Fa" Ruogan Wenti de Jieshi (II) (最高人民法院关于适用《中华人民共和国合同法》若干问题的解释(二)) [SPC Judicial Interpretation II on Contract Law] (promulgated by the Trial Comm., Sup. People's Ct. Apr. 24, 2009, effective May 13, 2009), art. 14.

98. 1 WANG LIMING (王利明), HETONG FA YANJIU (合同法研究) [STUDIES ON CONTRACT LAW] 658–59 (1st ed. 2002).

99. *Id.*

100. HAN SHIYUAN (韩世远), HETONG FA ZONGZE (合同法总论) [GENERAL THEORY OF CONTRACT LAW] 175–80 (3d ed. 2011).

101. *Id.*

invalidation."[102] The SPC's reasoning was that if courts without restraint declare contracts invalid based on violations of any mandatory provision of law, such judicial actions would destroy the fundamental principles embodied in the Contract Law.[103] Therefore, under the SPC Judicial Interpretation on Mining Rights Disputes, courts must exercise great prudence in determining a contract null and void. It may do so only if the contract violates a mandatory provision of law or regulation relating to the effectiveness of the act or mandatory provision of effectiveness.[104]

Some scholars argue that the mandatory provisions of environmental and natural resources laws and administrative regulations should be categorized as mandatory provisions of management, since environmental laws are public laws, which mostly regulate management public resources and rarely regulate private civil conduct.[105] For example, the act of engaging in a pollution generating activity (e.g. operation of a facility that emits pollutants) without a permit is illegal under China's Environmental Protection Law.[106] However, the law does not render the act null and void. It only provides an enforcement mechanism that authorizes the government to fine, prosecute, and perhaps shut down the operation.[107] Indeed, when it comes to following these environmental laws and regulations, some operators are willing to pay a certain amount of fines in exchange for continuing of their exploitation activities.[108] Because of the low statutory penalty amounts,[109] some

---

102. Zuigao Renmin Fayuan Guanyu Yifa Shenli he Zhixing Minshi Shangshi Anjian Baozhang Minjian Touzi Jiankang Fazhan de Tongzhi (最高人民法院关于依法审理和执行民事商事案件保障民间投资健康发展的通知) [SPC Notice on Adjudication of Civil and Commercial Cases] (issued by the Sup. People's Ct. Sept. 2, 2016), sec. 3.

103. SHEN DEYONG (沈德咏), ZUIGAO RENMIN FAYUAN GUANYU HETONG FA SIFA JIESHI (II) LIJIE YU SHIYONG (最高人民法院关于合同法司法解释（II）理解与适用) [UNDERSTANDING AND APPLICATION OF SPC JUDICIAL INTERPRETATION (II) ON CONTRACT LAW] 127–30 (2015).

104. *Id.* at 131–32.

105. LV, *supra* note 77, at 19–20.

106. Envt'l Protection Law, *supra* note 81, art. 45.

107. *Id.* arts. 59–69.

108. HUO Siyi (霍思伊), *Huanbao Zhifa Kunnan Chongchong:Qiangzhili Queshi Zhifa Zhouqi Manchang (环保执法困难重重:强制力缺失执法周期漫长)* [*Difficulties in Environmental Enforcement: Lack of Enforcement Force and Long Enforcement Cycle*], CHINA NEWSWEEK (May 5, 2017), http://www.china.com.cn/top/2017-05/05/content_40752675.htm.

109. *Huanjing Weifa Chengben Di Fakuan Cengjing Buji Yitian Shebei Zhujing (环境违法成本低罚款曾经不及一天设备租金)* [*The Low Cost of Environmental Violation: Fines Used to be Less Than One-day Equipment Rental*], FUJIAN DAILY (Mar. 8, 2015), https://news.qq.com/a/20150308/006751.htm.

companies merely include the fines in calculating their cost of doing business.[110]

This article argues that the environmental and natural resources law has the attributes of both public law and private law.[111] Violation of its mandatory provisions should not merely trigger administrative punishment but should invalidate the private acts. Invalid civil conduct should be subject to state interference and be non-performable.[112] In addition, as demonstrated in the *Jinhe* judgment and analysis of the Green Principle of Civil Law, the consideration of public interest is important in determining whether a provision is one of effectiveness or management.[113] If the performance of the act in violation of the provision injures public interest, then the law should be deemed mandatory affecting the validity of the act. Thus, the specific criteria for evaluating whether provisions of an environmental law or regulation affect the validity of a contract or merely regulate or manage the conduct under the contract should be as follows: (a) if the mandatory provisions clearly stipulate that violations of such laws will invalidate the contract, then those provisions shall belong to the mandatory provisions of effectiveness;[114] (b) even if the mandatory provisions do not stipulate that violations will invalidate contracts, but performing the terms of the contract will damage the state or public interest, then such provisions should also be deemed as mandatory provisions of effectiveness;[115] and (c) if the mandatory provisions do not explicitly stipulate that the violation will affect the validity of contracts, and if the continuing performance of the terms of the contract will not injure the state interest or public interest, but only the interests of

---

110. XING Feilong (邢飞龙), *Duo Zhuanjia Jiedu Xin "Huanbao Fa" Niuzhuan Weifa Chengben Di Nanti (多专家解读新《环保法》:扭转违法成本低难题)* [*Experts' Interpretation of the New Environmental Protection Law: Turning around the Problem of Low Illegal Cost*], CHINA ENVT'L NEWS (Dec. 31, 2014), http://www.chinanews.com/n/2014/12-31/6928398.shtml.

111. ZHOU KE (周坷) ET AL., HUANJING FA (环境法) [ENVIRONMENTAL LAW] 17–18 (6th ed. 2016).

112. WANG LIMING (王利明), MINFA ZONGZE YANJIU (民法总则研究) [STUDIES ON THE GENERAL PRINCIPLES OF CIVIL LAW] 578–79 (1st ed. 2003).

113. WANG LIMING (王利明), WOGUO MINFA DIAN ZHONGDA YINAN WENTI YANJIU (我国民法典重大疑难问题研究) [STUDIES ON THE MAJOR DIFFICULTIES IN DRAFTING THE CIVIL CODE] 460 (2006); Sichuan Jinhe Kuangye Youxian Gongsi Su Xinjiang Lingang Ziyuan Touzi Gufen Youxian Gongsi (四川金核矿业有限公司诉新疆临钢资源投资股份有限公司) [Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.], 2017 SUP. PEOPLE'S CT. GAZ. 41 (Sup. People's Ct. 2017) (China).

114. *See* SHEN, *supra* note 103, at 133–35 (describing the application of contract law).

115. *Id.*

some specific parties, then those provisions shall belong to the mandatory provisions of management.[116]

In the *Jinhe* case, Article 26 of the Nature Reserves Regulations prohibits mining and other activities in nature reserves. It does not explicitly stipulate that violations of the Article will void the relevant mineral resources development contract.[117] However, mining is strictly prohibited and the mining permit, which should not have been issued under the law, did not change the compulsory prohibition of the regulation.[118] In finding the contract violated the Nature Reserves Regulations under Article 52 of the Contract Law, the SPC in effect held that the mandatory prohibition under the regulations was a provision of effectiveness. The SPC further found that the contract—if deemed valid and fulfilled—would cause severe damage to the natural ecological environment and injure the environmental public interest.[119] Moreover, in light of the Green Principle, which requires one engaging in a civil conduct to act in accordance with the principle of resource conservation and environmental protection, mandatory provisions of environmental laws and regulations, which serve an important public interest, should be considered mandatory provisions of effectiveness, the violation of which could invalidate a contract.

VI. PROTECTION OF THE ENVIRONMENT AND NATURAL RESOURCES IS A PUBLIC INTEREST, THE VIOLATION OF WHICH CAN RENDER A CONTRACT NULL AND VOID.

The *Jinhe* case and Judicial Interpretation on Mining Rights Disputes also establish that if a contract violates environmental public interest, it can be deemed invalid. While the analysis of the mandatory provision under Article 52 is intertwined with the public interest analysis,[120] a contract or civil act that complies with the law but violates public interest is still invalid.

According to Chinese Civil Law, civil subjects who engage in civil activities must not violate the law, public order, and good customs.[121] The Principles of Public Order and Good Custom make up for the fact that imperative laws cannot create safeguards for all aspects of social life. As a basic principle of the Civil Code, the Principle of Public Order and Good Custom, requires civil subjects engaging in civil activities not to contravene

116. *Id.*

117. Nature Reserves Regulations, *supra* note 14, art. 26.

118. *Jinhe*, 2017 Sup. People's Ct. at 41.

119. *Id.*

120. *See* ZHU, *supra* note 89, sec. 1 (positing that mandatory provisions and public interest analyses are, in fact, two sides of the same coin).

121. GENERAL PRINCIPLES OF CIVIL LAW, *supra* note 74, art. 8.

the state interest and public interest, and not to violate the moral standards accepted by all members of the society.[122] This Principle is of great significance in coordinating the conflicts between individual interests, public interests, and state interests, in maintaining a normal social, economic, and living order, and in filling the gap between morality, reality, and law.[123] The activities that seem not to violate the existing mandatory provisions, yet actually harm the common interest of the public and undermine the social and economic order, violate public interest under the Principle of Public Order and Good Custom.[124] Thus, public interest is one of the key factors in measuring whether a contract is valid or not.

In *Jinhe*, the SPC held that if the contract were deemed valid and permitted to proceed it would result in serious ecological damage and would injure environmental public interest.[125] Indeed, the mining activities were taking place in a nature reserve, which was established to preserve the habitat for a state-protected animal—the Marco Polo sheep. Even though the mining activities were permitted by the local authorities, allowing them to continue would destroy habitat for the protected animal and cause erosion, pollution, and other damage to the ecology of the nature reserve. In selecting the *Jinhe* case as a typical case, the SPC specifically noted that courts should give special review of the validity of such resource exploration and exploitation contracts even if they were authorized by local government agencies.[126] It further noted that courts should not only focus on the realization of the parties' intent in entering into the contract, but also consider the protection of ecological environment and natural resources as a crucial factor.[127]

In issuing the Judicial Interpretation on Mining Rights Disputes, which specifically provides that a resource exploration and exploitation contract could be found to be null and void if it injures "the environmental public interest," the SPC acknowledged that "[m]ineral resources have both economic value and ecological value, and the exploitation and utilization often have negative environmental externalities."[128] It prescribes that if any

122. *See* LI, *supra* note 71, at 30–31 (describing the general principles of civil law).

123. *See* WANG, *supra* note 112, at 133 (describing the underlying principles of civil law).

124. *Id.* at 132.

125. Sichuan Jinhe Kuangye Youxian Gongsi Su Xinjiang Lingang Ziyuan Touzi Gufen Youxian Gongsi (四川金核矿业有限公司诉新疆临钢资源投资股份有限公司) [Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.], 2017 SUP. PEOPLE'S CT. GAZ. 41 (Sup. People's Ct. 2017) (China).

126. SPC Ten Model Cases on Mining Rights Disputes, *supra* note 61.

127. *Id.*

128. ZHENG XUELIN (郑学林), SPC ENVIRONMENT AND RESOURCES DIVISION, Zuigaofa Fabu Shenli Kuangyequan Jiufen Anjian Sifa Jieshi (最高法发布审理矿业权纠纷案件司法解释) [SPC Issuance of Judicial Interpretation on Mining Rights Disputes], (Jul. 27, 2017).

act of exploiting and utilizing natural resources within special regions results in ecological destruction, ecological function loss, or damage to environmental public interest, the court—taking the national development strategy and the common wellbeing of the people into consideration—should negatively judge the contracts signed by the parties.[129] This not only is a policy dissemination and behavior guidance for the public, but also is in line with the current ideas and requirements of green development and ecological civilization construction.[130] The temporary development of economy should not be achieved at the expense of the long-term survival rights of future generations.[131] Environmental public interest is an important public interest, the violation of which could invalidate a contract.

VII. THE JUDICIARY CAN PLAY A CORRECTING FUNCTION IN RESPONSE TO LACK OF ADMINISTRATIVE ENFORCEMENT OF ENVIRONMENTAL LAWS.

The *Jinhe* case is a judicial response to the unregulated resource exploration and exploitation that were happening in special protection regions, particularly those in the more remote western parts of China. The holding provided a legal hook to prevent the continued illegal exploitation of resources in special regions in cases where the administrative agencies have failed to act and indeed where they have permitted such illegal actions to continue. The SPC's designating the *Jinhe* case as a typical case and its subsequent Judicial Interpretation on Mining Rights Disputes provide the tools to lower courts to address the problem of illegal resource exploration and exploitation in special regions.[132]

A. The Limit of Administrative Law Enforcement in the Dilemma Between Economy Development and Environmental Protection

Many of the western regions of China, particularly, special regions, such as nature reserves, are rich in mineral resources.[133] In some areas, a large part of the local government's fiscal revenue comes from the mineral industry, and the exploration and exploitation of mineral resources remain a mainstay of local economy.[134] Therefore, the contradiction between environmental

129. *Id.*
130. *Id.*
131. SPC ENVIRONMENT AND RESOURCES DIVISION, *supra* note 68, at 236.
132. *Id*. at 241–42.
133. *Id*.
134. *Id*.

protection and economic development will always be prominent within these regions.[135]

To promote economic development, some local governments ignore the needs of environmental protection and ecological conservation and approve mining and other projects in prohibited development regions.[136] This leads to soil erosion, destruction of surface plants and landscapes, pollution of water bodies, soil pollution, subsidence of ground, reduction of biological diversity and other environmental pollution and ecological damage that is hard to rehabilitate.[137] Apart from the foregoing *Jinhe* case, illegal development and destruction of the ecological environment in the Gansu Qilian Mountains National Nature Reserve aroused widespread concern in Chinese society. In that case, several officials were held accountable and got stern punishment.[138]

It is not uncommon for competent administrative authorities to avoid enforcing environmental and natural resources laws and administrative regulations in the name of local economy protection.[139] Some local environmental legislations even fail to meet the minimum requirements of national laws and policies and relax the standards of law enforcement to "protect" the illegal exploitation behaviors.[140]

In addition, the cohesion gap between different competent administrative authorities also provides opportunities for illegal development and utilization of natural resources.[141] In the past, the mineral industry departments and the nature reserves protection departments did not coordinate with each other and did not present a unified management.[142] The mineral industry departments reviewed the conditions for mining development in issuing and renewing mineral permits, without considering whether the mining areas were located

---

135. *See* ZHU, *supra* note 89 (noting dispute between environmental protection and mining developments).

136. *See* ZHENG, *supra* note 128 (noting the protection of economic development).

137. SPC ENVIRONMENT AND RESOURCES DIVISION, *supra* note 68, at 234.

138. *See Zhongban Guoban Jiu Gansu Qilianshan Guojia Ji Ziran Baohu Qu Shengtai Huanjing Wenti Fachu Tongbao* (*中办国办就甘肃祁连山国家级自然保护区生态环境问题发出通报*) [*Notice on Issues Relating to Gansu Qilian Mountains Nat'l Nature Reserve*], XINHUA NEWS (Jul. 20, 2017), https://news.china.com/domestic/945/20170721/30992111_all.html#page_2 (detailing the illegal mining operations and other development activities in the Qilian Mountains National Nature Reserve in Gansu Province, which were permitted by local government agencies).

139. *Id.*

140. *Id.* Gansu Provincial government passed administrative regulations on the Qilian Mountain National Nature Reserve, which failed to comport with the national Nature Reserves Regulations. The local regulations prohibit only certain activities–hunting, land reclamation, and open burning–while omitting the other enumerated activities that are prohibited under national regulations, namely, logging, grazing, fishing, mining, and harvesting, etc., thus allowing many of these prohibited activities to take place in the reserve in violation of the national regulations. *Id.*

141. SPC ENVIRONMENT AND RESOURCES DIVISION, *supra* note 68, at 241.

142. *Id.*

within a nature reserve.[143] When illegal mining activities were found or reported, the nature reserves protection departments might issue verbal warnings to the relevant enterprises or give law enforcement advices to the local governments, but in many cases, there was not much they could do because the enterprises had official mineral permits.[144] In the *Jinhe* case, the plaintiff tried to justify its illegal mining activity by arguing that the government had issued a mining permit and had never suspended or terminated their permit, and that some other mines had also been permitted in the same nature reserve.[145] The trial court accepted these arguments.[146]

Moreover, third parties cannot challenge mining permits, since only the administrative counterpart—namely the permit applicant—has the right to sue the government under the Administrative Litigation Law.[147] If the administrative departments do not take the initiative to revoke their own permits, or strictly enforce the environmental and natural resources law, it is difficult for other administrative departments or citizens to correct them.[148]

B. The Correcting Function of the Judiciary and Special Review on the Validity of Contract.

As the *Jinhe* case demonstrates, the court can fill the gap left in the law and in the implementation of the law by administrative agencies. Because of the neutrality of the court, it can play a rectifying function when hearing environmental and natural resources cases, and make up for the deficiencies of the administrative law enforcement.[149] By doing so, they can stop parties from performing their illegal development activities and force the relevant administrative authorities to review the permits they have issued.[150]

Indeed, the *Jinhe* case and the SPC Judicial Interpretation on Mining Rights Disputes effectively promoted the execution of a notice issued by ten

---

143. *Id.*

144. *Id.* at 242.

145. Sichuan Jinhe Kuangye Youxian Gongsi Su Xinjiang Lingang Ziyuan Touzi Gufen Youxian Gongsi (四川金核矿业有限公司诉新疆临钢资源投资股份有限公司) [Sichuan Jinhe Mining Co. Ltd. v. Xinjiang Lingang Res. Inv. Co. Ltd.], 2017 SUP. PEOPLE'S CT. GAZ. 36–37 (Sup. People's Ct. 2017) (China).

146. *Id.* at 38.

147. Xingzheng Susong Fa (行政诉讼法) [Administrative Procedure Law] (promulgated Apr. 4, 1989, revised Jun. 27, 2017), art. 12(3) (mandating that, in permitting cases, people's courts shall accept complaints filed by citizens, legal persons or other organizations against an administrative agency for "its denial of, or failure to respond within the statutory period to, an application for administrative licensing or any other administrative licensing decision made by the administrative agency").

148. SPC ENVIRONMENT AND RESOURCES DIVISION, *supra* note 68, at 242.

149. *See* ZHU, *supra* note 89 (discussing history of environmental protections in enforcement).

150. *Id.*

ministries and commissions of the Central Government, led by the Ministry of Ecology and Environment, to all provinces and autonomous regions, municipalities, and relevant governmental agencies.[151] The notice highlighted many incidents of illegal development, including mining, in nature reserves and the impact that these illegal activities have created, directing the parties to coordinate to conduct inspections, develop remediation plans, and strengthen the management and protection of nature reserves.[152] This has resulted in concrete efforts by the Xinjiang government to phase out illegal mines in the Taxkorgan Nature Reserve.[153]

Moreover, the role of the courts in reviewing the validity of contract is grounded in Contract Law and the SPC Judicial Interpretation. In addition, while the typical case designation does not confer binding authority on the *Jinhe* holding, the commentary in the typical case announcement stresses that in hearing cases involving development of special regions that required protection under the law, courts are not confined to reviewing the validity of the contract in a vacuum.[154] They are to consider the development potential or protection restrictions of such regions in accordance with the National Main Functional Plan. For instance, in cases involving resource exploitation in areas that are designated for development, courts may consider the ecological carrying capacity of the environment and the need for development.[155] In cases involving areas where development is prohibited, especially in areas designated for protection because of its ecological sensitivity, courts should implement the strictest protection measures.[156] The courts may do so even if the activities have been approved by certain administrative authorities.[157] These considerations inform the evaluation of whether a contract violates a mandatory provision of effectiveness as well as whether it violates environmental public interest. In addition, the Green Principle of the Civil Code offers the courts a basis to review whether a private civil act contributes to "conservation of resources and the protection of the environment."

---

151. Guanyu Jing Yibu Jiaqiang Sheji Ziran Baohu Qu Kaifa Jianshe Huodong Jiandu Guanli de Tongzhi (关于进一步加强涉及自然保护区开发建设活动监督管理的通知) [Notice on Further Strengthening the Supervision and Management of Development Activities in Nature Reserves] (issued by the Ministry of Env't and Ecology et al. May 6, 2015).

152. *Id.*

153. BAI, *supra* note 15 (noting that, since 2018, government invested more than 45 million yuan [about 6.5 million US dollars] to restore areas once granted for mining; restoration work has proceeded for 37 mines located within the reserve and illegal mines have been phased out of the Pamir area).

154. SPC Ten Model Cases on Mining Rights Disputes, *supra* note 61.

155. *Id.*

156. *Id.*

157. *Id.*

VIII. CONCLUSION

The *Jinhe* case illustrates a unique challenge that China faces as it implements its green development strategy. This challenge is prominent in the special regions where mineral resources are rich and local interest for economic development is strong. In order to develop economically, some local governments give little weight to environmental protection and resource conservation principles. Illegal mines spring up in nature reserves and other special protected regions. The *Jinhe* case demonstrates that the judiciary has a role to play in filling in the gap created by the lack of administrative enforcement and administrative challenge to these facilities. In reviewing the validity of resource exploration and exploitation contracts, the judiciary must balance the relationship between economic development and environmental protection, properly measure the effective requirements of contract, enforce the Green Principle of the Civil Code, and safeguard the environmental public interest. In the application of the Green Principle, the judiciary must actively review the validity of natural resource contracts, to see if they violate the obligation of environmental protection.[158] When there is conflict between contract purpose and the environmental protection, and no clear laws to apply, the judiciary can hold the contract invalid on the ground of the Green Principle, if the behavior would seriously damage the environment.[159] By prohibiting the illegal exploitation of resources and preventing the destruction of the environment, the judiciary can contribute to the ecological civilization construction and green development in China.[160]

158. *See* LI, *supra* note 71, at 4 (describing the application of civil law).
159. *See* LV, *supra* note 77, at 20 (describing environmental protections in the civil code).
160. *See* ZHU, *supra* note 89 (discussing benefits of environmental protections in court decisions).