

Indiana Int'l & Comp. Law Review

Volume 32

Number 2

2022

SYMPOSIUM TRANSCRIPT

INTERNATIONAL LAW AND THE ENVIRONMENT: SUSTAINABILITY, JUSTICE, AND CLIMATE CHANGE AROUND THE WORLD

MARCH 4, 2022

WELCOME & INTRODUCTION

DEAN KAREN E. BRAVO*
BRITTANY DOYLE**
MARLEE JACOCS***

Dean Karen E. Bravo:

Good morning and welcome to the annual *Indiana International and Comparative Law Review* Symposium. We are pleased to see so many of you virtually here with us. We hoped this year we would be able to meet in person, but with ongoing COVID-19 concerns, we decided a virtual forum would be the best option for this year. Thank you for joining remotely, and we hope to see you in person next year. This year's Symposium is focused on issues of climate change, sustainability, and the environmental justice challenges that confront corporations and communities as well as individuals here in Indiana and all across the globe. We have an exciting lineup of panelists and environmental law experts from all over the world representing public and private sector actors. Be sure to stay tuned in for the keynote address at noon today presented by Dr. Carlton Waterhouse, Deputy Assistant Administrator for the Office of Land and

* Karen E. Bravo is the dean of the Indiana University Robert H. McKinney School of Law. Dean Bravo is the first person of color and the second woman in the school's history to lead the urban-based institution. She is the 13th dean of the law school since its affiliation with IU in 1944. Dean Bravo joined the IU McKinney faculty in 2004 and has served in several leadership roles, both within the law school and on the IUPUI campus. She became vice dean in Fall 2018.

** Brittany Doyle serves as the Executive Symposium Editor – Live. J.D. Candidate, Indiana University Robert H. McKinney School of Law, Class of 2023; M.A. Public Relations, Indiana University School of Arts at IUPUI, 2012; B.S. Political Science & Public Relations, University of Southern Indiana, 2008.

*** Marlee Jacocks serves as the Editor-in-Chief of the *Indiana International and Comparative Law Review*, volume XXXII. J.D., Indiana University Robert H. McKinney School of Law, Class of 2022; B.A. English, Ball State University, 2019.

Management at the U.S. Environmental Protection Agency, and very importantly, a wonderful former colleague here at the law school and beloved professor of our students. Thank you for attending the Symposium. I would be remiss if I did not congratulate and thank our student editors and Symposium leaders for putting together such a fantastic program today. A real testament to their innovation, their determination, and ability to bring together experts from all across the world. Please now welcome our Executive Symposium Live Editor, Brittany Doyle.

Brittany Doyle:

Thank you, Dean Bravo. Today's Symposium consists of three parts. First, we will have a presentation on climate change. Our second panel will focus on environmental sustainability, and at twelve o'clock we will have a keynote address from Dr. Carlton Waterhouse. We allotted ten minutes for audience Q&A at the end of each panel. You are welcome to enter your questions in the chat at the bottom of your screen during the presentations, and your questions and submissions are private. Only the presenters and Symposium staff can see your submissions. Please welcome Marlee Jacocks, Editor-in-Chief of the *Indiana International and Comparative Law Review* to explain the CLE.

Marlee Jacocks:

Thank you, Brittany, and good morning everyone. I am Marlee Jacocks, and I have the privilege of serving as the Editor-in-Chief of the *Indiana International and Comparative Law Review*. I want to take a moment to express my gratitude for and recognize the hard work of the Symposium leaders, including Brittany and her counterpart, Analiese Smith, and team members Virginia Speck and Lizzie Ford.

Turning to the CLE credit and information for today's event. Please note we must be able to monitor your participation throughout the duration of today's lecture in order for you to receive CLE credit. Please make sure you are not joining over the phone by calling in and instead tune in via your computer or the Zoom app on your phone. To monitor the engagement, there will be three polls administered throughout each one-hour presentation. The polls will not be announced, and you are not graded on your answer, but on whether you respond. Each poll will stay up for a total of two minutes. Do not miss your chance to answer. At the bottom of the screen, you should see the Q&A feature you can use to pose questions to the speakers. At the end of the lecture, our speakers will reserve ten minutes to answer the questions. If you have CLE-related inquiries, contact Barbara Bleeker, and her contact information is on the screen. Thank you.

PANEL I: CLIMATE CHANGE

MODERATOR: MR. STEVE WOLFSON

PANELISTS:

PROFESSOR CHRISTOPHER ROSSI

PROFESSOR DAVID COX

PROFESSOR YANMEI LIN

MR. JESSE KHARBANDA

MR. H. MAX KELLN

Ms. Doyle:

Thank you, Marlee. Let's get into the introduction of our Climate Change panelists. First up is Christopher Rossi, an associate professor at UiT, the Arctic University of Norway. He is the author of five books on international law and has written numerous law review articles. Professor Rossi served in the Clinton White House National Security Council as Director of Human Rights, Democracy, and Humanitarian Affairs. He has a Ph.D. in international relations from Johns Hopkins, an LL.M. in public international law from the University of Iowa, a J.D. from the University of Iowa, and a B.A. from Washington University. Welcome Professor Rossi.

Our next panelist is David Cox, an environmental law attorney. Mr. Cox's expertise centers on international, environmental, and energy issues. He is licensed to practice before the United States Supreme Court and the United States Court of International Trade. Mr. Cox has taught at numerous universities, including Indiana University, and he was appointed to Justice Sandra Day O'Connor's Eastern European Initiative to advise former Soviet bloc countries on environmental issues after the fall of the Berlin Wall. He has also advised numerous federal agencies on environmental issues, including the E.P.A., Department of Defense, and the Army Corps of Engineers. Welcome Professor Cox.

Our third panelist is Professor Yanmei Lin, senior research professor & associate director of the US-Asia Partnerships for Environmental Law at Vermont Law School. Her research, which she will share with us today, focuses on China's development of environmental governance. Professor Lin helped design and implement environmental law training programs for Chinese judges and attorneys. She is the author of over thirty academic articles both in Chinese and English. Professor Lin was named the 2022 Richard Brooks Distinguished Faculty Scholar, an award given for significant contributions to the scholarly mission of the Vermont Law School. She has been called the "unsung publishing hero." Previously, Professor Lin worked with the American Bar Association Rule of Law Initiative's China Program and a researcher for the China institute of

Environment and Resources Protection in Minority Areas. She has a Ph.D. in Environmental and Resources Law from China University. Welcome, Professor Lin.

Our next panelist is Jesse Kharbanda, the Executive Director of the Hoosier Environmental Council, Indiana's largest environmental policy organization. Mr. Kharbanda focuses the H.E.C.'s initiatives around environmental health and justice, land and water protection, and climate solutions. Mr. Kharbanda also has a strong focus to expand the tent of people who care about the environment. He was named to the prestigious "40 Under 40" by the Indianapolis Business Journal and holds graduate degrees from Oxford University. Thank you for being here, Mr. Kharbanda.

Our final panelist is Max Kelln, partner at Faegre Drinker Biddle and Reache. Mr. Kelln is fully devoted to the practice of environmental law and keeping up with trends and developments. Mr. Kelln specializes in helping municipalities and businesses come up with unique and practical solutions to be in compliance with state and federal environmental laws. Mr. Kelln previously worked for the state of Indiana and as the Environmental Health & Safety counsel at an international pharmaceutical company in New York. Welcome, Mr. Kelln.

And our moderator for this Climate Change panel is Mr. Steve Wolfson. Mr. Wolfson is a senior attorney with the International Environmental Law Practice Group of the E.P.A. and an expert of international and comparative environmental law. Mr. Wolfson is particularly interested in the intersection of environmental rule of law and vulnerable populations, as the poor are often the most vulnerable. His position affords him the opportunity to work with numerous government agencies including the State Department. Mr. Wolfson, I am turning the floor over to you to begin the panel. Thank you.

Steve Wolfson:

Thank you so much, Brittany, and welcome everybody. We have a terrific and diverse panel today, including leading scholars and public and private sector experts. I know each panelist has a lot to share with us. Just a reminder to the panelists that we want to have some time for each panelist to speak and have some discussion at the end so let's keep us on track timewise. Now let's begin with the panel presentations and Professor Christopher Rossi you are up first.

Professor Christopher Rossi:

Thank you very much. Can you hear me? Let's start with problem number one. Egypt has run out of water. Egypt has one hundred and two million people. Egypt is fed and hydrated by the Nile River which has two branches. There is the White Nile which forms from the Central Africa catchment area of Lake Victoria, and there is the Blue Nile which forms from the highlands of Ethiopia. For our purposes, it is the Blue Nile that is important here because the Blue Nile forms

eighty-seven percent of the water column from the Nile River and flows north through Sudan and Egypt to the Mediterranean. Ethiopia is the water tower for the Nile and actually for all of the Horn of Africa. If you look at a map of Egypt, you will see that Egyptians live on just 3.5 percent of their land. Egypt is the driest country in the world, and Egypt surpasses the deficit threshold for countries experiencing severe water scarcity. That means only through conservation, only through recycling, and only through food subsidies is Egypt currently able to cover its Nile water deficit.

Problem number two is British colonial rule and an antiquated treaty system. As you remember, Britain controlled Egypt and Sudan from 1882 to 1922, and British rule formally ended in 1956. There was something called the Anglo-Egyptian Condominium Agreement which jointly ruled Sudan, but in fact, the British and the Egyptian flag were really controlled by the British, and the Khedive of Egypt only nominally participated in the Condominium Agreement. Britain had strategic objectives to find a pathway from Central Africa to the Mediterranean and Suez Canal region, and it found that pathway through the highway of the Nile River. In doing so, the British also accommodated strategic interests relating to its world domination of the textile trade, thanks to water coming from the Nile to hydrate Egyptian cotton. These were the objectives of a treaty system that began in the 19th century and continued through the 20th century that established hydro-hegemony in the name of Egypt for the benefit of an imperial European power. We have the 1929 Anglo-Egyptian Exchange of Notes which granted Egypt, read British imperial interests, control of twelve times the amount of water that was allotted to Sudan as it was called, and it also granted Egypt veto power over the construction of projects on the Nile. There is a 1959 Nile Water Agreement that increased Egypt's share of Nile water to fifty-five billion cubic meters as opposed to Sudan's interest which was eighteen billion cubic meters of fresh water. The problem was the Sudanese never had an ability to use all of their original share. So Egypt got accustomed to using far more water than was allowed, though today, it won't even say how much. This intake agreement between two downstream signatories ignored calls for upstream riparians from the White Nile and from Ethiopia, meaning the Blue Nile, to participate in negotiations. For those who remember your Roman Law, there is a principle of *pacta tertiis* which makes inapplicable treaties as opposed to third parties. Egypt also secured through British-controlled water interests relating to the flow of the White Nile. Interestingly, and importantly for our purposes, there is no Blue Nile, which is eastern Nile basin-wide agreement, to utilize and manage the water that exists and flows from Ethiopia through Sudan to Egypt. History shows international law was used in this purpose to virtually forfeit the water rights of upper riparians, and you have some projects involving Italy's attempted takeover of Ethiopia which resulted in an agreement in 1902 whereby Ethiopia promised not to obstruct the flow of the Blue Nile. This 1902 agreement has been used by Egypt to suggest that the water that is flowing from Ethiopia cannot be obstructed at all. The Ethiopians say otherwise.

We come to problem number three. Ethiopia is building a mega-dam.

Ethiopia is building this dam right on the other side of the border with Sudan. It is called the Grand Ethiopian Renaissance Dam, or GERD. It is Africa's largest mega-dam, and it will take five to twenty years to fill this reservoir. It will submerge an area four times the size of Cairo. It is twice as tall as the Statue of Liberty, and it is as wide as the Brooklyn Bridge is long. It will cover seventy-four billion cubic meters, and for Hoosiers, that means it will submerge sixty-four million acres of land in one foot of water.

Here is the real problem. Scientific models project that the mean and interannual variability of annual water flow through the Nile will increase by fifteen to fifty percent due to climate change. This dramatic increase in the Nile's output is the real danger facing the Nile. During periods of drought, it is feared that Ethiopia may seek to store GERD water for power generation, and this water would not then go to Egypt and Sudan for agricultural and municipal use. Therein lies the rub. Egypt quietly recognizes that this dam is a *fait accompli*, and that its position, Egypt's position, as the hegemonic waterpower over the Nile, which it has claimed a hegemonic rule since the time of the pharaohs, is in danger. What Egypt now argues is that the dam should be filled in a slow period of time, between twelve and twenty-one years, but the Ethiopians are not playing by the rules set by Egypt anymore.

So, hydro-egoism is hurting the chances of peace over an existential issue which is access to fresh water, which as I just said, the Egyptians are in very short supply of. We need to resort to customary national law to figure out what the rules of engagement are in this trilateral relationship. Customary international law holds that reasonable and equitable utilization of transboundary water resources is the sine qua non for peaceful riparian relations. There is a water treaty. The 1977 U.N. Watercourses Convention which says this in articles five and six. However, the equitable use principle in this treaty is not applicable because Ethiopia and Egypt have not ratified the treaty. In fact, none of the riparian countries surrounding the Nile have ratified this treaty. The Convention also requires consultation with downstream States from the beginning of such mega-projects. There was no consultation, and Ethiopia began the project during the Arab Spring in 2011, and nobody knew about it until it was too late. The 2010 International Court of Justice Pulp Mills case also found that mega-dams are required to take part in environmental impact analysis. Which allegedly was done, so say the Ethiopians, but there is no proof of that. There is a considerable complaint in the international community about the degradation to the environment that is being caused by this mega-dam. However, if managed properly, the GERD promises energy and water rewards for each of the riparian neighbors of the Blue Nile.

The solution here is to return to a principle of cooperative framework and agreement, which does exist. There is a forestall agreement on how to manage this resource, and it fundamentally relies on the principle, of the Roman Law Principle of Servitude, which is to say the territory of one State serves the interest of another. This includes dominant States which have servient obligations, such

as upper riparians have, and it includes lower riparians. There are reciprocal obligations under customary international law that will apply to the management of the Nile so that we don't end up with an example of the Harmon Doctrine which the United States once attempted to apply against Mexico, which as the upper riparian, meant the United States turned the spicket of the Rio Grande off, and it ran dry the river of the Rio Grande in Mexico. This was the most notorious example of riparian relations and servitude that you can imagine, and it was immediately discredited. However, if we cannot resolve in a peaceful way the re-establishment of a cooperative framework agreement between these three riparians, we are going to run into a problem if and when the Nile River runs not dry, but subjected to drought, and there is substantial evidence that shows that rivers flood and rivers run dry, and there are periods of time that have been scientifically shown to be affected by climate change which will turn into a draught area for the Nile River.

If we cannot fix this problem, there is going to be a very substantial chance of war. Egypt has already promised it and the question is how we can reestablish principles of servitude, Roman Law principles, relating to riparian relations before a draught occurs. Benefits will accrue because mega-dams create mega-electricity, and it also creates water pools for hydration that you can sell like shares. This is what Ethiopia promises to do when the times are good, but everybody is fearful, due to climate change predictions, that times will soon turn bad. In which case the control over the GERD waters of Ethiopia will become a potential problem. I will stop there. Thank you.

Mr. Wolfson:

Thank you so much, Professor Rossi. That was fascinating. Our next speaker dealing with a different geographical area is Professor David Cox.

Professor David Cox:

Thank you. I am very pleased to be with you today. I would like to thank Dean Bravo and Indiana University School of Law for hosting this conference, and in particular, Analiese and Brittany for inviting me to participate. I also want to recognize my teaching assistant, Sarah Colletti, who was invaluable in helping prepare this presentation, and my chief of staff, Professor John Moreland is in the audience today. I think you are in for a real treat in general with the presenters today. I see a lot of talent and intellect and a lot of different subjects that are going to be covered.

I am going to talk to you about Vietnam's environmental and energy policy, but when you see Vietnam, I want you to see potential and possibilities because I think that they are a model for what can and is happening in many developing countries. Many of which you may hear about today from other speakers. For the last ten years, I have worked with Vietnamese National University, which is a leading environmental and energy school in Vietnam, to help them develop their

environmental and energy policy and to make recommendations to the government. They have actually adopted Indiana University's Environmental Law course as the cornerstone of their environmental law curriculum. And it will not surprise you to learn that within the academics and decision-makers involved in that process, the ultimate answer is to shift from traditional sources of energy to alternative sources of energy, but there are many obstacles to doing that.

So we know Vietnam is in Southeast Asia. Population of ninety-three million. I am not going to read all of these slides in the interest of time. It will not surprise you to know that Vietnam has traditionally relied on coal fossil fuels and natural gas for energy production. And of course, at one point their view of alternate energy or alternative energy was to tap into an infrastructure that would allow them to take advantage of energy produced through nuclear power plants and through hydroelectric power plants, neither of which are extensively located in Vietnam. So if Vietnam wants to move into the contemporary view of alternative energy, and move past the use of coal, oil, and fossil fuels. And I have to mention timber here because, traditionally, Vietnam was an area covered with dense forests and jungles. And a lot of that has been clear cut away as Vietnam was forced to use internal resources to try to meet its energy demands.

Now, here are the obstacles as we look through, if you want to just generally go through the next slides until we get to the goals for reduction of carbon emissions, I am sure the audience can glean some background from those slides. If Vietnam wants to move from traditional sources of energy to alternative sources of energy, there are certain economic stumbling blocks or obstacles. You can see from a number of these slides that consumption easily outpaces production. And so these economic barriers to Vietnam that have existed for years, prevent them from entering the free market and having the funds necessary to develop alternative energy. One of these problems is infrastructure. Certainly, they have a dilapidated power grid, and even transporting fuels and other types of products on roads can be problematic with traffic and roads that are dilapidated. One of the interesting things I learned when I went to Vietnam was that their view was that the United States should come back into Vietnam and develop an infrastructure in what formerly was north Vietnam, similar to what they did for south Vietnam because you have this disparity between the infrastructure that was put into place by American troops and the problems to the north with infrastructure. So infrastructure from the power grid to traditional infrastructure is one of the economic obstacles.

Of course, another economic obstacle is the economy. The Vietnamese economy is highly inflationary and really quite challenging in terms of coming up with resources to try to invest outside of the country. Since consumption exceeds production, they do not really have that much by way of marketable exports, Vietnam does not have the cash or the currency or the clout to be able to attract businesses and other governments easily to volunteer or to invest in the Vietnamese economy. When I was there last, it took eight thousand Vietnamese dollars to buy a packet of M&Ms and it took twelve thousand Vietnamese dollars

to buy a Coke, one hundred and thirty-eight Vietnamese dollars for a taxicab ride, and five hundred thousand Vietnam Vietnamese dollars for a hotel room. You could see how inflationary it is. Now at one point, it took one million Vietnamese dollars to equal fifty dollars in U.S. currency. One of the problems here is raising capital. Another problem is that the Vietnamese government is skeptical of outside investment and imposes a lot of restrictions in terms of ownership or regulation of anyone or any entity that wants to get involved in Vietnam. So a lot of those restrictions are prohibitive and discourage companies and other countries from getting involved in the process. You have a situation in which that is another economic obstacle, the economy, the infrastructure, and the political situation, although that is beginning to change somewhat.

Still, Vietnam has established some goals in terms of reducing carbon emissions. Their plight is not unlike what we experienced with the Eastern European countries after the fall of the Berlin Wall or really any other developing country at this point. After the fall of the Berlin Wall Justice O'Connor's goal was to have a group of professors and attorneys that could advise Eastern European countries on environmental energy issues. Obviously, they did not have an environmental protection in place, and they did not have a way to address hazardous and industrial sites that were contaminated. But, these Eastern European countries' first priorities were to deal with public health, security, their economy, and rebuilding their countries. And so environmental and energy issues worked in the forefront. So I think you see the same thing with developing countries that have large segments of an impoverished population, or that they are trying to attend to the needs too, and so environmental and energy issues are not always at the forefront.

I want to talk to you about a particular problem. We talked about the fact that Vietnam has focused on trying to transition and center the environmental policy to alternative energies but has traditionally used traditional sources. I am going to talk about Ha Long Bay, which is in northeastern Vietnam. It is one of those areas of the world that is known as the Eighth Wonder of the World. And as Brittany flashes through the next several slides here, you are going to see a tale of two cities. Ha Long Bay is a resort town. It is very popular in Europe because of these islands you see in the background. These islands are a wonderful environmental view to see. They are very breathtaking. But when Vietnam is forced to turn internally and use resources that are available to it, because it cannot afford to export or purchase resources from outside of the country, the double-edged sword here is that these islands often contain coal reserves. The tale of two cities is that you have this wonderful resort on one side with literally hundreds of these islands lined up the eastern coast of Vietnam literally crossing the bridge to the east, where they are beginning to extract coal from these islands and use it as an internal resource, which obviously creates pollution problems. And so the water is polluted. The beach is polluted. The air is polluted and you literally, within half a mile, can see a total disparity between a resort town and what seems to be an industrial town where they are extracting coal from these islands, which has obviously the effect of destroying many of these islands.

Undesirable. So one of the things that we have been looking at is trying to develop alternatives to extracting the coal from these islands. They have already deforested much of the country in terms of timber. They can only afford a limited supply of fossil fuels. So coal is one of the main resources that they rely on to fuel power plants and support their energy demands.

What has to happen for Vietnamese policy to change? Well, I have done science for forty-two years. And one of the, I guess my take on all this has always been, it is important to have people that paint with a broad brush on climate change issues. And I guess very interesting with them—so many analogies between the pandemic and climate change because climate change is another one of those issues where the science appears to be unequivocal. Yet there was a large segment of the population, and particularly in this country and the decision-makers, that deny that it is a phenomenon or a situation that exists. The real issue here is how to make these changes practical. It is important to have policy analysts. It is important to set goals, but what has to happen for developing countries like Vietnam, is there have to be resources available. There has to be funding. There have to be companies and countries that are willing to invest in Vietnam and invest in alternative energy. One of the things we are working on right now is attempting to link Vietnam to some European countries that are willing to invest in alternative energy and help Vietnam avoid the plight of Ha Long Bay.

In essence, that is what I would want to leave you with today that I think Vietnam is an area of tremendous potential, but this is not going to happen by talking about it. It is going to happen because there's an investment of funds. There is an investment of people, an investment in alternative energy, and an investment in human resources.

My last slide here is one of my classes from Vietnam. And I thought this was fascinating. These fifty-six students that I had in an environmental law class in Vietnam, and these students fought through pollution, poverty, and traffic, a dilapidated school, yet their vision was how can we use this knowledge and this information to change and help the world. I have taught in Europe. I have taught in Canada. I have taught in the United States. I have taught in Vietnam. I have done video conferences with other areas. And I always find students the same. That they have some vision on making a difference and on changing the world and doing something that will matter and help the environment. So in that sense, I think that you will find that there are students sympathetic to this goal all over the world. And I hope we can take advantage of that. Thank you for the opportunity to speak today. Thank you, Steve. And I will yield to the next speaker.

Mr. Wolfson:

Thank you so much, Professor Cox. And I will just add that when I visited Vietnam for the E.P.A. a few years back, I was also very, very impressed by the

energy and enthusiasm, both among the government officials there and also among, the young students and young people involved in the NGO community, the non-governmental organizations working on environmental issues in Vietnam. So without further ado, we will move on to our next speaker, Professor Yanmei Lin from Vermont Law School. Please take it away.

Professor Yanmei Lin:

Thanks, Steve, and thanks to the Indiana University School of Law for this great opportunity for me to share our work in China to support civil society groups led by environmental public interest litigation. We have been working in China for more than a decade and our focus is really to support the civil society efforts to participate in China's environmental governance. Right before the COP26 last year, China submitted its updated NDC [National Determined Contribution] to the UNFCCC [United Nations Framework Convention on Climate Change]. Although we know the schools are not completely new, but compared to China's first NDC, the updated NDCs are, I think are more ambitious, which aim to have this CO2 emission peak before 2030, and achieve carbon neutrality before 2060, and China aims to increase the share of non-fossil fuels in primary energy consumption to around twenty-five percent.

We also know China is facing many challenges to achieve those goals. In particular, the long-term goal of achieving zero emission before 2060. For example, you can see here that China has the greatest number of coal fire power stations compared to any country or territory in the world. And almost fifty percent of the global coal electricity generation is from China, and China still heavily relies on coal for its energies. To meet the long-term goal of civil emissions, China has to strengthen its domestic laws and policies and use additional efforts to further restrict new coal construction and accelerate the retirement of existing coal capacities.

To accelerate the efforts at the international level, China and the U.S. issued a Joint Glasgow Declaration showing their intention to cooperate on enhanced climate actions and meet the Paris Agreement goals in the coming years. I think during this geopolitical tension between the two countries, the Declaration is a starting point for them to build trust and develop new ideas that can shape and accelerate climate action, including regulatory frameworks and new legal tools and environmental standards.

At the domestic level, although Xie Zhenhua, China's climate envoy, said at the press conference announcing the Glasgow Joint Declaration that in China when we make a commitment, we will take real action and honor our commitment. But we also have to see that there are fundamental tensions in China between centralized session of authority, which is the central policy, like trying to meet the zero-emissions goal, but also the tension between effective local governance. So whether the policy can be effectively implemented at the local level is really the question. In recent years, in order to address this fundamental

tension, the Chinese government introduced an Environmental Public Interest Litigation [EPIL] system, which is a bottom-up approach that was first nationally enacted in 2015, to empower civil society group to file EPIL in courts to hold polluters and ecological destructors accountable for their environmental violations. The EPIL cases did not only promote environmental compliance. NGO-led cases resulted in pollution cleanup, remediations, ecological restoration, and payment of environmental damages.

In 2017, the EPIL system actually expanded to improve the prosecutors. Prosecutors are the legal monitoring authority in China, and the EPIL system enabled them to sue government agencies for their illegal actions or inaction on enforcement. At the end of 2017, the Chinese government issued a pilot policy to enable government agencies that are tasked to manage natural resources and the environment to file ecological damages claims in the courts. By the end of 2020, more than four hundred NGO-led environmental public litigations were filed with the courts. I think many of those cases do not directly address climate mitigation, but many of them actually are related to climate mitigation. Here are some landmark cases that you can see that show the spectrum of legal advocacy actions NGOs took that address climate litigation. The first case is Friends of Nature; one of China's oldest NGOs filed a case suing the China Sinohydro Group company. This case is very significant because they challenged the China hydro-power and stopped the dam construction in order to protect the habitats of China's endangered species, green peafowls, shown here. This is a preventive case, which means that a development project that is not sustainable and does not protect biodiversity will be barred or will be challenged and stopped by the courts. This case was selected as one of the ten cases that promoted the rule of law in China in decades.

Another case is Friends of Nature suing Hyundai Motor, and this case is trying to hold the automobile industry accountable for emission standards updated by the Chinese government through the updated clean air law. This case is trying to promote a transportation transition to more clean fuel and electronic cars. More cases are shown here that target coal fire power plants, trying to stop coal fire power plants' environmental violations of their standards and trying to recover environmental damages through the coal fire power plant. The fourth type of case are from the All-China Environmental Federation [ACEF]. They are suing a real estate developer for using outdated materials that could not meet building codes and promote green building and circular economy law implementation in China. And, very common in EPIL cases, it is the NGO suing operators on illegal mining and illegal deforestation to protect the Carbon Sink.

And there are two pending cases that directly address climate change. We call them the core climate litigation cases in China. And in this case, Friends of Nature are suing State Grid Gansu Branch and Ningxia Branch, and the plaintiff contends that these branches failed to purchase the qualified electricity generated by wind power and solar power plants and causing this waste of renewable electricity to be replaced by coal power. The plaintiff requests that the defendants

pay for the wasted renewable energy, and electricity, and compensate for environmental damages. Even though this case is still pending in the courts, the national energy authority actually issued several policy documents requiring the state corporation to update the grid and give the local government the means to address these containment issues.

There are still many challenges for NGOs and civil society actors in China to address climate mitigation. For example, China's NGOs still have not been granted a standing to hold the government accountable. China still has not enacted a national climate change law, so there is no specific legal responsibility for the local governments to meet their carbon emission targets. Recently, we heard that the Supreme People's Court is trying to issue guidelines to help the courts to [hear] more cases that relate to climate change. One suggestion put forward is to allow cases that challenge local governments' policy and normative documents that are not inconsistent with the central government's climate goal. Finally, one type of case to watch is China's NGO trying to target financial institutions. According to China's Green Credits policy, financial institutions are not to fund projects that are not consistent with the climate goals.

I think there is still much work to do, but one thing we can say for sure is that there are many sectors in China, in particular the civil society groups, that are very active in trying to meet the zero-emission goal in China. That is what I would like to share. I will give the floor back to Steve.

Mr. Wolfson:

Thank you so much, Professor Lin. And next, we have a local perspective from the Hoosier Environmental Council. We have Jesse Kharbanda. Please take it away, Mr. Kharbanda.

Jesse Kharbanda:

Good morning, everyone. Thank you, Steve, for the moderation and Brittany, for the invitation, the McKinney School of Law for hosting this, and to all of you who are attending. If you are not familiar with the Hoosier Environmental Council, we seek to advance a vision of greater environmental health and justice, of land and water protection and accelerated climate solutions. The means by which we do this are through education, technical assistance, and public policy advocacy.

What I would like to talk about is near-term opportunities to advance climate solutions in Indiana. And you might say, well for an international conference like this, why does Indiana matter? To put things in perspective, of course, when we think about climate solutions, we are probably thinking about the national level and the landmark infrastructure and investment in jobs act that was passed, which will lead to significant investments in transit and rail and in our grid and in electric vehicles. And we might also think about efforts to try to resurrect the

Build Back Better bill that President Biden has been championing, but we know that it is facing paralysis right now in Congress. And I think that is what really gravitates us towards the states. Indiana may appear very small in the global context, after all, we are only 0.085 percent of the global population and 0.4 percent of the global GDP. Yet, Indiana is very plugged into international markets. We have eight hundred employers in Indiana that are of international nature and more than two hundred thousand jobs in Indiana are attributed to these international investors. Furthermore, Indiana plays an outsize role in America's economy. We are the top manufacturing state in the U.S. We are top five in agriculture in the U.S. We have been a top coal state, of course, not something to brag about from a climate perspective, but that is something pretty noteworthy about our economy. We are one of the leading states in terms of the density of our highway network. If we decarbonize and adapt in an innovative rapid way, then I think Indiana can be a real model for an array of peer states that are of a similar ideological nature, as you can see from this map.

What I would like to do is talk about briskly in the Indiana Statehouse, where the Hoosier Environmental Council spends a lot of our time, and really hone in on those particular public policies that are being debated and advanced in the General Assembly that have to do with climate solutions. This might be a little bit counterintuitive for people who follow the Statehouse because there is this perception that there is a lot of denialism, but the rhetoric is changing, and the comfort level with climate issues is changing. Even among those who might be perceived as the greatest skeptics.

Let's talk first about just overall emissions—climate solutions that cut emissions. Of course, we know that the power sector has historically been the dominant source of greenhouse gas emissions in the United States. That is changing because of the retirement of a number of coal plants. And now transportation is number two, but electricity is still a major contributor to greenhouse gas emissions. So let's start there. One area that the General Assembly has debated increasingly is on rooftop solar. There were five bills in the General Assembly that had to do with trying to make rooftop solar more accessible and affordable for Hoosiers. You might think, well, this is the domain of the wealthier, the upper middle class, and so forth. But the fact of the matter is the National Renewable Energy Lab has concluded that we could get forty percent of America's electricity from rooftop solar. The public policy that we establish in Indiana really matters. Now, it also matters because, as we see from this graph, there has been a profound and exponential increase in the number of natural disasters facing America, and rooftop solar plays an important role because it decentralizes the electricity grid. And we see that in this image right here. Decentralization reduces risk and increases the resilience of our grid. One thing to keep in mind here is that there is going to be one bill that will become law that will make rooftop solar more accessible for those who live in a homeowner's association. That is a meaningful area of climate solution progress in the General Assembly.

The second area is around electric vehicles. As I mentioned, transportation is now the dominant source of carbon emissions in America. One dimension, of course, of decarbonizing the transportation sector is switching to electric vehicles. We see here that regardless of the underlying grid, electric vehicles are found to cut emissions drastically. The public policy to be aware of here is that there is a bill that will also become law that will allow utilities to establish pilot programs for electric charging stations and for facilitating investment in the purchase of electric vehicles in the service territories of the different utilities in our state. This is going to significantly increase EV [Electric Vehicle] infrastructure in Indiana and will become law.

A third area is transit. In this case, the General Assembly has been a bit hostile to this climate solution, where there have been efforts to try to undermine the expansion of IndyGo, which is by far Indiana's largest mass transit system. Thanks to an array of diverse advocates, bills that would have undermined mass transit in Indiana were defeated. This matters because transportation is the top source of greenhouse gas emissions in America. As you can see here, there is a much lower carbon footprint on a unit basis for transit versus traditional automobiles.

Another area that was discussed in the General Assembly had to do with something called SMRs, which are Small Modular Nuclear Reactors. These are nuclear power plants that are dramatically lower, as you can see from this image, than your traditional nuclear plants. But the problem that we have at the Hoosier Environmental Council regarding SMRs, is that there are very costly means of cutting carbon emissions on a per megawatt-hour basis, compared to a paradigm centered around renewables and storage. Yet having said that, a bill that will facilitate future investment in SMRs is also going to become a law. Another area that is also going to become law has to do with carbon capture and storage. This, of course, is this notion of liquefying and injecting carbon dioxide into the subsurface, possibly ten thousand feet underground. And there is a bill that again, will become law, that sets the state regulatory framework for making investments in carbon capture and sequestration.

Now, let me spend just a couple of minutes talking about climate solutions that make us resilient. One is wetlands. As many of you know, we passed a really devastating bill that wipes away a significant amount of state-level protections for our wetlands, and wetlands are an incredibly important climate solution because they act as an enormous sponge. In the backdrop of more frequent and more intense flooding, wetlands are vital to prevent downstream flooding. And yet we passed a law last year that significantly deregulates state jurisdictional wetlands. Now, there was a bill introduced this session that would have provided tax credits to property owners that protect the wetlands. Unfortunately, this bill was denied a hearing. Another bill that falls into the realm of climate resilience has to do with renewable energy projects of a utility-scale. And the thing I want to topline here is this issue of the groundcover underneath these solar farms. Is it going to be like this, which is turf grass, or is it going to be like this, which is pollinator-friendly

deep-rooted grass. That has huge implications for the climate resilience of rural Indiana. Happy to talk more about that in the Q&A.

There is also the issue of coal ash waste pits, which are located along rivers. In this backdrop, but more frequent and more intense flooding, these coal ash waste pits can be ticking time bombs from a climate resilience perspective, because they are unlined, and they are very close to riverbanks. There is a worry that they could end up contaminating our rivers. This has certainly happened as we have seen in other states. Unfortunately, the bill in this context was denied a hearing as well. We made progress in terms of climate mitigation in the General Assembly this session, but not really so much on the resilience side. There was an effort to try to enact a climate task force. That bill was also denied a hearing and, on a positive note, a bill that would have tied the hands of our state regulators to initiate rulemaking more stringent than the federal government was defeated in the Senate against remarkable odds. So, with that, I look forward to staying in touch with you and look forward to the panel discussion.

Mr. Wolfson:

Fantastic. Thank you so much for that local Indiana perspective, and also a global perspective on what is happening in Indiana. Now to round out the panel, our final presentation is from Max Kelln of Faegre Drinker Biddle and Reath law firm to discuss representing companies and the regulated community. Please take it away, Mr. Kelln.

H. Max Kelln:

Hey, good morning. I will just get right into it. At Faegre, I really do have the pleasure of helping companies craft and implement what is called Environment and Social Governance, or ESG, policies. It is a real sort of buzzword these days around corporate management. As a result, I really get a front-row seat on how these companies are adapting to the growing national and really international regulations around greenhouse gases. A quick example, here in Indiana, I had the pleasure of recently touring one of the automotive manufacturing facilities here in our state. As Jesse [Kharbanda] showed, we have quite a number of them. At the facility, I got to meet over a dozen greenhouse gas engineers employed by that company that is located just at that plant. Now, I bet you, those jobs probably did not even exist over a dozen years ago. So it is really surprising to see that level of change here over the last ten or fifteen years. I want to kind of touch on a few trends here regarding litigation involving U.S.-based corporations that have an impact on their projects and operations overseas. I cannot believe it, but it has been almost fifteen years since I graduated from the IU McKinney School of Law. The types of lawsuits that were sort of all the rage back then were these investor activist/investor lawsuits that are investors of U.S. based corporations suing U.S. based companies based on environmental type claims that may be in investor documents, like a prospectus. If you are an investor in that company and you feel like the company misrepresented what it said in its prospectus in terms

of its environmental goals, including climate change, you could file a derivative lawsuit for damages claiming that it affected shareholder value.

Now, the second round of environmental type regulations around companies was involving so-called green claims. That is companies who make specific product claims regarding environmental sustainability or some other environmental-related claim with respect to a specific product. I think these lawsuits are still ongoing. A recent one is against a cosmetic company around its claims that its cosmetics are all-natural, yet, it is alleged that testing of those products contains what is called PFAS [per- and polyfluoroalkyl substances], which is a sort of emerging bio accumulative contaminant that is mostly unregulated here in the U.S.

The third type, and this is the more recent trend that we are seeing, are lawsuits by environmental groups, not by consumers themselves, but environmental groups sort of on behalf of consumers against companies regarding their global statements regarding sustainability and environmental compliance, pointing to statements that are made in tweets or on their website or otherwise made by their CEOs. The most recent example is this lawsuit filed by the Earth Island Institute against Coca-Cola in the Superior Court for the District of Columbia in June of 2021. Essentially the lawsuit alleges that, contrary to Coca-Cola's representation, the company remains a major plastic polluter, does not have a sustainable enterprise as it claims on its social media, and has a long history of breaking the public promises and sustainability goals that it makes, pointing to things like its sustainability report. As a result, this group has filed a lawsuit under a state consumer marketing statute claiming that these claims are meant to persuade consumers to buy their products, and that they are deceptive, or that they fall under these deceptive marketing type statutes that a number of states have. Pointing to companies and the statements that they have made as if they are a kind of standard marketing type claim and trying to get companies to live up to those goals I see as a sort of new round and new sort of evolution of those types of lawsuits that really began as investor lawsuits over a decade ago.

Ms. Doyle:

Thank you very much, Max. We are going to begin the Q&A session. Several questions were submitted. This question is specifically for Professor Cox. What roles do other Asian countries, specifically those with large GDPs, such as China and Japan, play in Vietnam, reaching its environmental goals? And are there areas of international trade or other agreements between Vietnam and these other prosperous countries that could help Vietnam more quickly reduce its dependence on homegrown fossil fuels?

Professor Cox:

Well, it is my personal opinion that help is going to come from the United States or from Europe or from other countries. There are difficult relationships

between Vietnam and China, Vietnam and Korea, and several other Southeast Asian countries. A lot of that is rooted in conflict from the sixties and the seventies. Certainly, there is a potential role to play for countries like Korea and other countries that have an abundance of resources, but it has not really happened historically. I think it is more likely to come from European countries that seem to be ahead of the rest of the world in terms of development of alternative energy, alternative energy policy, or the United States or Canada. I guess my view is that would be wonderful. There could be more inner cooperation between Asian countries on these issues, at least as far as Vietnam is concerned. And Steve may have a different experience. I do not really see it.

Ms. Doyle:

One question for the whole panel: how might the conflict between Russia and Ukraine affect the abilities of countries to work together on international climate change initiatives? And this is open to the entire panel.

Mr. Wolfson:

Well, just maybe a minor point, but one thing that the conflict has done is it has taken over sort of the news space. The U.N. just released a very important report on climate change adaptation and impacts on Monday, and we have seen some coverage of that report but not nearly as much as the previous U.N. report in August. And this is sort of a sequel to that August report. And it is largely because the conflict in Ukraine has sort of pushed climate, not just off the news agenda, but sort of down on the priority list for people around the world, including people in governments. There is a very serious impact in terms of the attention level that climate is getting right now around the world.

Mr. Kharbanda:

You know, one other dimension I would add is just, I worry greatly about the fact that how are you going to involve Russia in future international cooperation. There is going to be so much anger continuing at Russia. How do you try to formulate bilateral agreements related to methane emissions from Siberia or cutting deforestation in Siberia, or of course, finding a way to decarbonize the enormous carbon footprint of the energy sector in Russia. I am extremely worried.

Ms. Doyle:

Thank you. Mr. Kharbanda, you stated that a bill will become law. Do you mean that the bill has already passed and then will be codified? Or do you mean that the bill is expected to pass? The General Assembly is in conference committee right now, I believe.

Mr. Kharbanda:

Yes. Yes. Great question. And the answer to that is that these bills have passed the House and the Senate. If there has been a situation of a difference between those two, rather than going through conference committee, the original bill author has concurred on the bill, which means that it goes through a concurrence vote where the bill author tends to be deferred to by the body in the General Assembly. These bills are destined to the governor and are going to be signed into law.

Ms. Doyle:

Thank you. Professor Cox, what types of energy generation are feasible in Vietnam? Assuming foreign investment does occur. Is there an openness to nuclear power or some skepticism about its safety as it is in the U.S.?

Professor Cox:

I do not really have a barometer in terms of whether there is, an openness to nuclear power. Certainly, a lot of the alternative energy resources that we see used in other countries, like solar, and wind power, because of the topography and geography of Vietnam, I think are extremely practical. And it could be applied to supplement Vietnam's energy sector.

Ms. Doyle:

Thank you. Professor Lin, China currently has four times as many coal power plants as any other country in the world, which clearly presents several environmental threats. What is the most likely alternative energy source that China could rely on to help reduce its number of coal power plants?

Professor Lin:

Sure, I think China already built a lot of renewable energy facilities and generates a lot of renewable energy, but in order to replace all of the coal fire power and only rely on wind power and solar is not realistic. I think, currently, they are still thinking natural gas would be the alternative energy for coal.

Ms. Doyle:

Great, thank you. Max, this question is for you. Climate change creates a wide array of environmental issues as we have discussed here. What subset of climate change issues do you foresee as having a global impact the fastest? An impact, which may ultimately lead to conflict in the future, and what can we do as a society? You represent corporations and communities, municipalities. How can communities prevent conflicts down the road?

Mr. Kelln:

That is a tough one to tackle. I do think the U.S. really does have pretty powerful tools at its disposal in the forms of laws and statutes that do affect corporate behavior internationally. I think the market is already reacting, given that the United States is such a global base of companies founded and headquartered here. We are going to continue to see that trend. I think one of them is in order to back up these environmental claims that corporations are making, they rely on various credits to make those claims. For example, a corporation may say that its operations are carbon neutral. Those claims are in part based on projects that are created by entities and groups, other than that corporation. The corporation will enter into a contract with some entity that does a project that creates these credits, but that project may be overseas. It may be in India. Those corporations will have to enforce those contracts in these other countries so that they can support those claims for U.S. investors and U.S. consumers. We are going to increasingly see more intertwined lines between things that corporations say and do in the U.S. and their operations overseas.

Ms. Doyle:

Thank you. We have time for one more question. This is for Professor Cox. How much of Vietnam's goals are compromised by its own geography? Is it a coastal country? My image is that it has lots of wetlands, so it is not harshly subject to flooding and ocean sea levels.

Professor Cox:

At least in the areas, I traveled and what formerly would have been north Vietnam and along the coast, or certainly large areas that would be conducive to alternative energy. And the irony of deforestation is that there are areas in which there are unfettered wind flow areas to put solar panels. In that sense, I think there is a great potential in Vietnam, even geographically for alternative energy.

Ms. Doyle:

Thank you. That concludes our first panel. For our climate change panelists, there are some more questions in the Q&A chat box, and you are welcome if you have time to try and answer those. But for now, we are going to switch to our sustainability panel. I do want to mention Professor Rossi had answered several of the questions, so I apologize for not directing questions to you. I should also mention that Professor Christopher Rossi, who was our first presenter, submitted an article for publication for the Symposium publication, which will come out in a few months, specifically discussing his presentation today. Stay tuned for that. Thank you very much to panel one.

PANEL II: ENVIRONMENTAL SUSTAINABILITY

MODERATOR: CHANCELLOR ANDREW R. KLEIN

PANELISTS:

DR. PROFESSOR STELLA EMERY SANTANA

MS. MEGHAN KRISHNAYYA

MS. MORGAN MICKELSON

Ms. Doyle:

We are going to transition to our Environmental Sustainability panel. And again, please be sure to type in any questions that you have during the presentations, and we will get through as many of those as we can.

I have the distinct honor to introduce our moderator for this panel, the new interim Chancellor of Indiana University, Andrew Klein. Chancellor Klein is the Paul E. Beam Professor of Law here at McKinney and a former Dean of the law school. Chancellor Klein focuses on the intersection of tort and environmental law and has coauthored two casebooks and a student textbook. He is a member of the American Law Institute and previously served as Reporter for the Seventh Circuit Court of Appeals Civil Jury Instructions Committee. Chancellor Klein, “Dean Klein” as he was previously known in these halls, is a favorite professor to us law students and has won at least ten student teaching awards over his career. He was also Editor-in-Chief of the Emory Law Journal while he was a student in law school. Chancellor Klein, thank you for being with us today. Please begin by introducing your panelists.

Chancellor Andrew R. Klein:

Brittany, thank you so much. Before I introduce our panelists, how about a virtual round of applause for Brittany and her students. I hope everyone here can see how proud we are to have students like this, doing this kind of work here at the McKinney School of Law, and I have to say now at the IUPUI campus, Brittany and to all of your classmates, we are really, really proud that you put something like this together, so thank you.

Ms. Doyle:

Thank you, sir.

Chancellor Klein:

It is my privilege to introduce a really outstanding panel of speakers. I am going to quickly give the introductions to the people that you will be hearing from, and then we will begin a conversation. One of our panelists today is Dr. Stella Emery Santana, who is an adjunct professor here at McKinney School of

Law, a former visiting professor here, and a really important part of the McKinney Law family. Dr. Santana has an extensive resume. I cannot go through the whole thing. She is a full-time professor of law at Centro University F.A.E.S.A. in Brazil. She is affiliate faculty at Florida International University College of Law in Miami. She is a member of the Brazilian Institute of Environmental and Corporativism Studies and Research, the International Sustainable Development Research Society, and a member of the Latin American Initiative for Law, Society and Culture. Which means Dr. Santana does a lot of stuff and is really smart we are eager to hear from her later today.

Our second panelist is Morgan Mickelson, the Director of the Office of Sustainability from the City of Indianapolis. Ms. Mickelson and her team are tasked with implementing the city's first sustainability and resilience action plan, Thrive Indianapolis. She previously worked closely with the Office of Sustainability as the Climate Advisor through the American Cities Climate Challenge. Ms. Mickelson holds a Master of Science in Climate Justice from Glasgow Caledonian University and currently serves on the Greater Indiana Clean Cities Board of Directors. Welcome, Ms. Mickelson.

Our third panelist is Meghan Krishnayya, Vice President of Compliance and Permitting at Brown and Caldwell. Ms. Krishnayya is a chemical engineer and brings more than twenty-four years of industrial and consulting experience to environmental, health, and safety management. More recently, Ms. Krishnayya has focused on clients' needs for water resiliency and sustainability, matching up water engineering projects that meet corporate environmental social, and governance goals with municipality and watershed needs in communities. We are really pleased to have you with us, Meghan. You can see what a great panel we have. We have public sector, private sector, and academics all together to talk about this important issue.

The panelists and I met about a week or so ago, and one thing we thought we would do before we get to the formal talks, is really quickly go around to each panelist and have them talk to you about what they mean when they say "sustainability." That is a word we throw around a lot, but we do not often define it. So really quickly, Dr. Santana, why don't you start. What does sustainability mean when you hear that word?

Dr. Professor Stella Emery Santana:

Thank you, Dean Klein. It is a pleasure to be here and yes, let's start it by discussing sustainability. There are two things that are important to understand—sustainable development and sustainability. In 1987, the World Commission on Environment and Development published a report called Our Common Future. They described what sustainable development would be. Sustainable development is a type of development that meets the needs of the present without compromising the ability for future generations to meet their own needs. I know this is an open and very vague concept, but they say that in order

to have sustainable development, we have to balance between three essential elements: economic, environmental, and social. Furthermore, as we develop new studies, the cultural aspect of sustainability is also included in this concept of sustainable development. So now we have four perspectives of sustainable development: the economic, the ecological, the cultural, and the social. All of them together—they are essential to understanding the requirements for sustainability. Now to achieve sustainability, we need to balance these elements. One might think now that sustainability and sustainable development are the same thing. The answer is no. Sustainable development is the pathway to achieving sustainability. Sustainability would be a long-term goal. Let's say we need to live in a more sustainable world. Sustainable development would be to have a sustainable agriculture, sustainable forestry, sustainable production, and so on. To finish this, the overall goal of sustainable development is that the long-term stability of the economy, the environment, and the social, our lives, it is only achievable through integration and acknowledgment of all these elements—the economic, environmental, the cultural, and the social, through the decision-making process. I give it back to you, the Dean Klein.

Chancellor Klein:

Thanks, Dr. Santana. That was really outstanding. Let's hear from Ms. Mickelson and hear from the public sector from the city. What does sustainability mean from your perspective?

Morgan Mickelson:

Thank you, Dean Klein. Dr. Santana, that was a wonderful definition. I like the global perspective, and then I will bring it down to the local as Dean Klein was suggesting. Here in Indianapolis, we are really focused on what makes stainable neighborhoods and that look like healthy, happy, and equitable neighborhoods. A key tenant to this that we constantly talk about is resiliency. I think that is the next word that I need to start communicating to people to ensure we all understand what I am talking about. Resiliency is basically the ability to recover from different disasters, whether that is a personal disaster you have or a natural disaster, that is giving you a hardship that you are facing in your life. The ability to recover from those is a central tenant to sustainability that we are now looking at when we are focusing on adapting to our new climate, and I will hand it back to Dean Klein now.

Chancellor Klein:

Thanks so much. Let's ask Ms. Krishnayya because you come at it from a corporate perspective, you are dealing in the private sector, and I would be interested in hearing how you define sustainability.

Meghan Krishnayya:

Very much. Thank you, Dean Klein. Appreciate that. I would put it back in balance. I am just looking at the balance of various environmental media with each other. So not trading air or carbon for water. If you are making advances in carbon that you are not having that detrimental effect on water, because you also need to take into balance the various stakeholders. It is really nice to see that we have moved forward, that the shareholder is no longer the most important stakeholder. The folks living in the community, the employees at industrial facilities and manufacturing facilities, those voices are a lot bigger to bring in that part of balance. Cause that, really is key for sustainability. Whether you are talking about carbon, water, circular economy, or biodiversity. Taking all those into account is really where we are focused right now in looking at sustainability and industry.

Chancellor Klein:

All right. I think that was fantastic because that really gives people a better sense of what we are dealing with when we talk about this important topic. At this point, I am going to have each of the speakers give their primary presentations. After they do, I may have a few follow-up questions, but I will also be mindful of the clock. And Brittany, certainly interrupt me if I am not mindful of the clock so that we can take some audience questions as well. Dr. Santana, the virtual podium is yours.

Dr. Santana:

Thank you so much, Dean Klein. I will be sharing a PowerPoint slide as well. So let's start from the beginning. First of all, I wanted to thank, I had great students helping me, research students, helping me to make these PowerPoint slides, and making the research itself. So I want to thank Hubert Logan from IU, he was the class from 2019. He did amazing research in Indiana. And my two former students from Brazil Natalia Bastas and Pedro Meladge have developed amazing work as well. So I appreciate it. So let's start from the beginning. My talk to you will build the legal aspects of water as a human right, according to the 2030 agenda, a comparative analysis between Brazil and the US. Now here in this first picture I have my son David, he is seven years old, enjoying the beautiful ocean and enjoying the clean, not polluted, ocean water. And in the bottom picture, I have Indiana's river. This is a picture from the Conservation Law Center website, and they made this incredible report on water and quality of life in Indiana. If you have not looked over this report, you will have, you must, that is something you really must do. So, we have both river and ocean waters that are going to be talking about here this morning.

It is important to understand that water is a human right, and as a human right, it is a precondition to human existence. No one can live without water. It is a necessity to sustain human life and clean water guarantees the minimum

conditions to live a dignified life, but not everyone, not every country has understood and understand today, that water is a human right. So, when we are talking about the right to water, what does it guarantee?

Well, we are first talking about physically accessible water. People should not have to walk five miles to get some water. We need to have enough quantity of water that you can use for your daily needs. You need to have safe water. Safe water means clean water. The quality of the water is good for human and animal consumption. Affordable water. It does not really matter if you have an expensive water bill that you cannot pay. This is not the right of water being guaranteed and all the right of water will be really directed to personal and domestic use of the water.

Here, you have a table that I made with the difference in this comparison that we are using about how water is understood as a human right internationally in Brazil and then in the United States. So internationally, this discussion started in 1977 in the Mar del Plata conference. In this Conference, it was the first time that water is considered an essential good for human life. And then in 1986, the UN Declaration on the Rights to Development talks about the basic need of water as a basic need. Then, in 1992, we have the International Conference on Water and the Environment also called the Dublin Conference. And they also talk about the importance of water to human life. The 1992 Agenda 21 also describes water as an important part of human life. We have to have water in a sustainable world. But for the first time as the world considered water as a human right, it was established in the UN General Assembly Resolution 64/292 from 2010. In 2010, that is when the United Nations, for the first time, really states that water and sanitation are basic human rights. Now, what happens in Brazil as we are doing this comparison between Brazil and the U.S? The 1988 Constitution guarantees a right to a clean and healthy environment. It does not talk about water nor water as a human right, but the courts here in Brazil have granted the right to access water, the right to water, and the right to water distribution. But we still do not talk about water as a human right, but in these court cases, we have had some judges stating that water is a basic human right. And that is why they granted these rights to those plaintiffs. In 1997, it was approved, the National Water Resource Policy. This treats water as a common good. It treats water as an economic value. But it also talks that we need to have a sustainable use of water. Brazil does not follow directly within its legislation, water as a human right, but we have already had established living court decisions that water is considered a human right in the country. Now in the United States.

Ms. Doyle:

Professor Santana, I am so sorry to interrupt, but your slides are not advancing for the screen. We are still on slide one.

Dr. Santana:

Really? What is happening? Let's see. Can you see now?

Ms. Doyle:

Now I am seeing the water and human rights.

Dr. Santana:

Oh, perfect. Thank you. I am sorry about that. So now in the United States, water is mostly considered as a public good and the U.S. abstained from adopting the UN Resolution 64/292 that established that water is a human right. But three states in the U.S. have legislation declaring that water is a human right. In California, in 2012, it was approved Assembly Bill 685. We have in the Massachusetts Constitutional Article 97, that established that water is a human right. And in Pennsylvania Constitution Article 1, Section 27, also states that water is a human right. So we have positive and negative moves around the world. Can you see my second slide? Is it moving now?

Ms. Doyle:

No, we are still on water and human rights. You are in presentation mode, maybe?

Dr. Santana:

Okay, let me try, just give me one second here. Let me stop sharing and go back again. Share screen. What about now?

Chancellor Klein:

You are on the next slide. You may just have to individually advance them because I think you are in presentation mode.

Dr. Santana:

Oh. Okay. Sorry about that. So what happens now, moving forward, then let's talk about sustainability. How do we get sustainability and water together? At the United Nations, every fifteen years, they launch a new program. In 2015, we finalized the United Nations Millennium Development Goals and in 2015 it starred in the UN Agenda. It established seventeen goals so we could achieve sustainability or a sustainable world. It is important to mention that for the first time we are having an index. So in each of these targets, we have one-hundred and sixty-nine specific goals that need to be achieved. There is a way to measure if we are achieving or not this goal of sustainability. The 2030 Agenda is in the category of international soft law. Which in other words, means that it is not a

hard law. It is not an international legally binding instrument. But it can, and should, guide states toward new decision-making processes in the future. And maybe it can lead in a few places to hard law as well. So in this presentation, let me see if now we will move. Is it going now? Did it change this slide?

Chancellor Klein:

No, it did not. So you just have to, you will just have to do to each time you move, you will just have to push the button yourself from your desktop.

Dr. Santana:

Yes, I am doing that and that is not going, this is disturbing. Sorry about that. So I do not know what is going on because . . . let's see again. Crossing my fingers here.

Chancellor Klein:

I think you are good now.

Dr. Santana:

Right to water and sustainability. So the connection between water and sustainability happens in two specific goals. Goal 6 is a clean water and sanitation and Goal 14 life below water. So Goal 6 is to ensure access to water and sanitation for all. While Goal 14 conserves and sustainably use the oceans, seas, and marine resources. One might be thinking now, are we talking about ocean as an important source of water as well? And I say, yes, oceans, they are very important to regulate rainwater, drinking water, weather, climate, and food. So even though the focus of Goal 14 is related to oceans, we cannot deny how important it is to the general goal of water which is Goal 6. Now, as we move forward, some scholars they have . . . now can you see my slides? Now I have to ask every time until we get it.

Chancellor Klein:

You are good.

Dr. Santana:

Thank you. So some scholars that do study oceans, they have connected Target 14 with Target 6 within, four specific targets, within Goal 6. Now just as an example, protect and restore ecosystems now on Target 14, and then we need Target 6 to protect and restore water-related ecosystems. So there have been studies combining these two areas. And the scholars that do research on water, they have connected water to oceans, and their view on how they are connected, just change a little bit by, for example, Goal 6.3, improve water quality

wastewater treatment, and safe reuse connected to reduce marine pollution, protect and restore ecosystems and reduce ocean acidification. There is a direct connection between Target 6, which is clean water, and Target 14, which is ocean water.

Now, how are Brazil and the U.S. doing in relation to SDG [Sustainable Development Goals] ranking? So there are one-hundred and sixty-five countries that compromise themselves to follow the SDGs. U.S. is thirty-two under one-hundred and sixty-five. While Brazil is sixty-one under one hundred and sixty-five states.

It is also important to mention that SDG 6 is better achieved in both countries, Brazil and the U.S. when compared to SDG 14. Oh, my goodness. SDG 14, it is almost nothing. We are going to talk about this very briefly. SDG 6, in Brazil, depends on political will. If we do not have political will, we will not make the necessary arrangements to achieve one hundred percent of the targets. While in the U.S., to achieve one hundred percent of the targets within SDG 6, the U.S. faces some challenges in water quality due to old infrastructure, water efficiency, and participation in the decision-making process.

The way each state in the U.S. deals with water management affects the U.S.'s overall targets, because, due to federalism, the U.S. states have more power to deal with environmental and river and management of their own resources than in a centralized country like Brazil. Now in relation to SDG 14, the main issue for all of the countries of the world is that most of the indicators within this goal, they do not have a global methodology. Without one, it is just almost impossible to measure progress. According to the United Nations, about forty percent of the world's population lives within a hundred kilometers of the coast. If we are not managing properly, the quality of our oceans, if we are not managing well the quality of fresh water, and if we are not managing domestic and industrial waste properly, the results will affect freshwater availability as a whole. Especially in times of rapid climate change as the presenters on the first panel demonstrated so well. More than three hundred million people around the world rely on desalinated water for some of or all of their daily water needs. In 2016, one hundred and fifty countries used desalination. It was the equivalent of 86.8 million cubic meters of desalinated water produced a day. This was produced from the International Water Association.

Now, and I am almost done. Why should you care? This is a map that shows water stress levels of urban areas with a population bigger than three million in the world. This data was produced by the World Resource Institute with data from the United Nations. You can see that here in North America and Middle East and Asia, and some parts of Europe, we are in a very level, extremely high level, of stress water. Now, all we need to live is water. We cannot live without water, but water is needed in all different dimensions. Let's say our basic everyday needs—agricultural and recreational use. So, as I said in 2020, this map was published in the New York Times. What happens when you have science

being published in a very well-known paper around the world? This map, by doing that, we see that every common citizen, those who are not experts or scholars on the issue, will start evaluating if things are going well, or if things are going bad. Now, in the areas that I just mentioned, you can see that people all over are being affected, and to be more specific, the economically disfavored are facing the major environmental injustice in our time, because they simply do not have water or cannot afford water.

Now, can you imagine a near future with climate change affecting how we predict the use and the needs of water? What the scenario will be? I have been researching water and oceans for over a decade, and I do not see much progress in achieving different goals as we move forward. But, I see each day more people, governments, and corporations, like you are going to see in this panel, making better-informed decisions and having better practices related to water, simply because more people are aware of the issues we are facing.

And finally, as future attorneys, public servants, and leaders of your cities, states, and countries, what will you do with this information? Let's think and act sustainably. And you can be sure that you can count on me to be part of the solution. Thank you so much for your time. Thank you for your patience.

Chancellor Klein:

Thank you, Dr. Santana. That was a really, really interesting presentation. We appreciate that. Let's make a transition, and I am going to turn the virtual podium over to Ms. Mickelson who is going to give us a call it a local perspective, but really it is a municipal perspective because my guess is that the perspective you bring to the table is similar to your colleagues all over the country. So, Ms. Mickelson, the podium is yours.

Ms. Mickelson:

Thank you, Dean Klein. Yeah, that is exactly right. I will actually be diving into our sustainability and resilience action plan today. All right. So please let me know if you are not seeing my slideshow?

Chancellor Klein:

We are good.

Ms. Mickelson:

All right. Perfect. This is just a brief overview of the Office of Sustainability. Our mission is that we lead by inspiring lasting environmental, economic, and neighborhood vitality through collaboration, education, and community action. We envision an Indianapolis that is resilient. A resilient community of inclusive and healthy, happy neighborhoods. These are just a few of our climate

commitments made by the administration. Most notably, Special Resolution 21 Mayor Hogsett made in 2017 in committing the City of Indianapolis to carbon neutrality by 2050. There are a few others, and we are still in declarations and other ones, notably the American Cities Climate Challenge that is wrapping up, but that brought me to Indianapolis and really dedicated a lot of resources to accelerating our climate action.

And then of course is Thrive Indianapolis, which I will dive into today. Notably, it is a part of the comprehensive plan of Marion County as well. These are just a few areas we are focused on, if you are interested, happy to dive into them more, but I will not spend much time today. They are more of our programmatic pieces to the Office of Sustainability. I think it is important to really discuss what climate change looks like here in Indianapolis, so we know what we are going to have to adapt to, right? We are going to see more rain and more extreme heat in Indianapolis as with many parts of the country. We will be seeing similar new hazards, so that rain is going to look like more precipitation overall, but more extreme events as well in which we receive a lot of rain really fast and that is going to overwhelm our infrastructure. That is something that our engineering team is thinking a lot about and how we might accommodate and adapt to that new normal. Additionally, extreme weather. More hot days. I heard recently that extreme heat is the number one killer in the United States around different climate hazards. So, it is really important. I think it is one of the number one killers because it is a silent killer, right? Like you do not really notice you are having a heatstroke until it is too late. We need to be looking at how we can make our neighborhoods more resilient to that. Whether it is creating a network of neighbors that are checking in on each other or different solutions, people can get really creative.

Now, let's dive into Thrive Indianapolis. I defined sustainability and resiliency a bit earlier. I will just dive right in. This is a bit of context around how Thrive was created. It is at heart a community plan. We wanted the community to have a say in what went into our plan. I really wrote, well, I really value this piece because I am able to rely on the action items being something that the community wants to see. Therefore, they are vetted a little bit, and I get to take that and really advocate for this on behalf of the community. This is our social vulnerability index that was created in conjunction with Thrive to help us make decisions. Basically, we took twelve different socioeconomic indicators and overlaid them on a map of Indianapolis. We also took the different climate hazards that we are expecting to see in Indianapolis and overlaid those two maps together to be able to identify specific neighborhoods that actually are going to be most at risk to these new hazards. Therefore, we should really focus our resiliency efforts here because it might be more difficult for these specific neighborhoods to recover from said disasters. This is just saying a brief overview of the different components of Thrive, just so you have the full picture.

Two overarching goals that are most important in my head related to climate change really guide the entire body of work in Thrive. Our commitment to carbon

neutrality, of course, and our commitment to an equitable implementation by prioritizing all decision-making through an equity lens. Additionally, we have four core values leading the plan with eight plan elements. Under each element: key objectives, action items, performance metrics, and output metrics. That is how we are going to be ensuring that we are implementing something. We are going to be able to measure it through these output metrics, much like how Dr. Santana was talking about. You need to be able to measure your progress to ensure you are actually achieving sustainability.

These plan elements are highlighted here on this map and it, to me, reflects the sustainable development goals really well in the sense that everything is interconnected to one another. Sustainability is just not just about renewable energy or ensuring that our green space is not polluted. It has every piece of our life that we touch interconnected. This helps to demonstrate how public health and safety is actually a key component to a sustainable future. Let me check the time. All right. The first element that I will dive into is the Built Environment. Here we really envision an Indianapolis that has sustainable buildings at its core, right? I will go ahead and jump to our first achieved action item, actually. It is a recent policy that we passed from the Office of Sustainability, which is to develop an energy and benchmarking program. That will just require large buildings to disclose their energy consumption to the City of Indianapolis. In turn, after you start understanding how much energy you are using, you are more likely to reduce your energy consumption. And so that is what we are helping to facilitate through this ordinance.

The economy section. This really looks at how a thriving economy is the underpins to a resilient neighborhood and community, right? We are looking at how to ensure that everybody has access to climbing the mobile economic ladder. Moving onto energy. We are, here in this section, we are really advocating for the transition to a renewable energy, both on our grid and locally, maybe at the household level. So one of the action items that was recently achieved actually was partnering through Sun Solar United Neighbors. They piloted a low to moderate-income program putting solar panels on the houses of individuals that qualified, and that was a really great program to help lower the energy burden. Urban agriculture looks at food insecurity and how that plays into true sustainability for a city. Our Office of Public Health and Safety leads most of those initiatives. Natural resources. This is really looking at our air quality and our green space. One of our flagship programs is Knozone, and this is an air quality awareness program that we administer through the office. A recent addition to our brand is a highly evolved brand encouraging the use of electric vehicles. Public health and safety. Again, this is managed by our Office of Public Health and Safety, but it is looking at how a safe community is truly resilient, right? Because we know all the systemic issues are interconnected and dependent upon each other. Transportation and land use is looking at how can we make shared mobility options a little bit more accessible for everyone so that you have the ability to take the bus if you so desire. One of the most recent action items here is the passage of our transit-oriented development ordinance, and this

will allow for more dense housing and more dense infrastructure along our bus rapid transit lines. We are really excited about the passage of this and what it is going to mean for our community. And finally, our last element is waste and recycling. Many people might know that this is the fastest-growing sector for greenhouse gas emissions. While it is relatively low, it is growing rapidly, and so we know we need to address this issue. Currently, we are looking at how we might support universal curbside recycling for the entire City of Indianapolis. And with that, I will turn it back over to Dean Klein.

Chancellor Klein:

That was a great presentation, Ms. Mickelson. I mean, I have to say I am struck both and daunted a little bit, by all that you have to address. But I'm also really impressed by what you have put together in our city, so my congratulations on that. Ms. Krishnayya, I am really excited for your presentation because it occurs to me that you, and your colleagues, in parallel roles plays such an important role because you really have to serve as the bridge between the sustainability issues in local communities, as we just heard, but also, the businesses that help keep our economy thriving. So, I am going to turn the podium over to you, and really interested to hear your reflections on the topic.

Ms. Krishnayya:

Thank you. Thank you so much Dean Klein, and it is great as a resident here in Indianapolis, and seeing what Indianapolis is doing through the Thrive Indianapolis program, it is just great to see what that is and how that connects to what we are doing in industry. So I wanted to share three perspectives that are key drivers right now for sustainability in industry. I am talking across the U.S., not necessarily specifically in Indiana, but Indiana is definitely a part of it. Regulatory drivers, stakeholder drivers, and disclosure are all key pieces that we are seeing move forward sustainability in a different fashion than we have seen it over the past twenty years. In regulations, industry is very used to being regulated with laws around permits, for air, for water, for waste. Looking at media in an individual fashion through the Clean Air Act, the Clean Water Act, through RCRA [Resource Conservation and Recovery Act]. But now we have environmental justice requirements such that industry needs to give consideration to what tends to be lower-income areas or more distressed areas where heavy manufacturing is occurring. And are those individuals much more exposed and much more sensitive and vulnerable to the air admissions, to the water quality in the areas of operation, and making sure that those requirements are being taken into consideration when applying for a permit or obtaining a permanent renewal.

There are also new regulations coming out later this year from the SEC [Securities and Exchange Commission]. So it is not just through EPA and through the state-related environmental agencies, but just as Sarbanes-Oxley [Act] came into account years ago for looking at environmental legacies and making sure that

corporations for setting aside money to clean up legacy sites that had groundwater impact, soil impact in areas where they were not operating. New SEC requirements that relate to sustainability or ESG, Environmental Social Governance are coming into play. That will have to put in balance the financial aspects as well as the environmental aspects of operating. I think of environmental justice and think of what has been in play with legacy sites for operations have ceased, but there is contamination in reasonably looking and working with the pharmaceutical company and trying to put into balance toxicity in groundwater and making reductions to go from parts per billion to parts per trillion in certain toxicities, but then recognizing and working with EPA, there is a tradeoff to reduce the toxicity of that groundwater. The tradeoff is a huge increase in electricity demand for treatment, and therefore, greenhouse gas emissions. And that will occur for the next thirty years of treatment. So really needing to balance this out and using some of the new tools for the groundwater, looking at groundwater that is not being used as drinking water, should there really be a trade-off then for the air that the community is breathing, both with greenhouse gas emissions and criteria pollutants. So those are new areas that are being looked at now whereas, in the past, they would have been looked at individually. And that is a really key driver being looked at for entire industrial portfolios.

The other pieces I mentioned earlier, you are talking about what sustainability means for me, is looking at the stakeholders, and no longer having a shareholder being the dominant stakeholder. You have employees, you have the communities, local governments, and local utilities that are all key players to industry and taking that into balance. I give a lot of thought to our powered industry, as you know, here in Indiana, we are making large transitions from coal to gas and looking a lot at renewables. And thinking about what the industry is looking at more so now is we cannot achieve everything just within the fence line. We need to be looking out. Outside the fence line as we look at the supply chain and what we need to bring in from the supply chain, what is going back out in the supply chain. Same piece happens with the environment and looking at natural capital. So, whether it is a power company or a mining company, taking a look at where you might have upstream and downstream impacts, that again, can be multimedia from an environmental standpoint. Thinking of a power plant right now, that is looking at an ability to meet permit requirements, so regulatory requirements, related to temperature with wastewater discharge and making sure that you are not increasing the temperature of a river in such a way that you are negatively impacting aquatic life. One of the best ways to do that is to look at how do you add biodiversity to that discharging surface water? How do you model out what adding new plantings, some of them are going to be shorter plantings, and some of them are going to be trees. But working on modeling what thirty years looks like in adding shade to a river along the riverbanks, that will also prevent stormwater erosion and sediment from going into the river, that will then again later cost money to have to take out and treat. But also increasing that biodiversity and habitats for sensitive creatures and creating a wonderful carbon sink at the same time with the plantings that you are putting in. So again,

what could easily be looked at as a Clean Water Act issue, looking at a permit complaints issue on temperature, has so many more opportunities outside the fence line and looking at making sure that you are treating fairly the community in which you are operating, where discharges happening, and not just the benefits downstream to possibly more affluent communities. And that goes in, taking a look at what is coming in upstream, and water is such an easy one to be able to visualize. If you take and make investments upstream in your surface water supplies to add biodiversity again, that also helps clean the water and you can get natural attenuation factors that help clean the water such that you are not having to do as much treatment and bring the water into your facility. Which again, not only costs but also adds more electricity demand, which is increasing your greenhouse gas emissions, other criteria pollutants, and emissions for it. So, being able to take a look at all those stakeholders working with them and what is the community looking for? How do you blend that in with community goals and net-zero goals for carbon, for water, that are being looked at for 2030 and 2050? That is just as important coming to industry because they can play part of that, and they have monies that they can help bring to communities that they are working in to help make those investments.

A key piece now that is happening, but especially over the last three years, is transparency occurring through reporting and disclosure. ESG reporting and disclosure CDP, Carbon Disclosure Project, is one that I have been working on for many years with clients, but there is now a global harmonization of standards occurring. And there is a rapid succession of harmonization that happened in 2021, and as we go through 2022, that part is going to equilibrate, which is extremely important for accountability. Because now it is not just qualitative statements or quantitative statements that are based on one-time wins for the environment of making a reduction by closing a facility, but it is holding to long-term goals using science-based targets or SBTs for accounting for methodologies that can be compared to each other. That way people can really start to understand commitments and, is there an actual impact that is happening? Where in the past the term greenwashing would have been used. There is a competitive edge to industry to have a global harmonization of these standards. Knowing what the goals are that they are working toward. But also saying that they can compare themselves to their competitors in that they are doing better in this area. That also happens to be really good for their stock price if they are a public company. And as a private company is really good as part of supply chain and attracting customers, but also attracting key talent to be part of their workforce. So, all of this is being taken into consideration now as companies look at their long-term operations. Where are they going to invest in additional operations? Where will they expand manufacturing? It is going to be a place that has water availability. It is going to be a place where they can easily put into balance environmental considerations with operations. They are looking at modeling these pieces and investing in their communities and being held accountable for it. Part of what I wanted to show here is with this global harmonization coming with standards, it will not solve the differences in regulations that we are seeing between Europe and the U.S. in particular, for multinational corporations. But having, what is on

the left here, having accounting standards and environmental standards, that are getting more aligned in a global harmonization will make it easier for corporations to make these commitments that are actually bringing results. To take their natural capital, put in their just transition plans, and get to those, those net-zero actions. You can see here the trending over time, almost twenty years here, carbon obviously has been at the forefront of it, but water and forestry have really been coming into play in much bigger spaces for the industry. In the monetization of risks and opportunities for corporations, shows that it makes sense, literal dollar sense, that it is five times more expensive to not act around the risks around water and in carbon than it is to actually take action on it. I will close, bringing it a little bit closer to home with the Mississippi River Region. If you take a look at what companies are reporting to CDP right now. In the Global Water Report in 2020, that \$1.93 billion worth of money needs to be invested to reduce water risk, and the cost of not addressing it will be \$2.5 billion. It is not exactly five times over cost here in the Midwest area because we are not so water distressed, but it is still a much greater cost to not act for the industry than to act. So, these pieces here of monetizing it are a huge driver in keeping folks motivated to reach those goals, and not just to be talking about it anymore and have an impact on the neighborhoods in where we are living and working. With that Dean Klein, I will put it back to you and questions that may have come in.

Chancellor Klein:

That was a great question, I mean that was a great presentation. I am going to take the privilege of doing just one moderator question of you, and then I will give it back to Brittany. We are conscious of time, and we do want to save time to get to the questions that we are seeing come in the chat. But one follow-up on my end, and I am going to direct it to all three of you. As you and probably most of the audience is aware, the United Nations has actually set Global Sustainable Development Goals, SDGs. So if you could briefly, I am going to go in this order have Ms. Krishnayya first, let us know whether corporations pay attention to the SDGs and set their goals around the United Nations targets. I would then like Ms. Mickelson to talk about whether Indiana, the City of Indianapolis, or other municipalities or government organizations are implementing SDGs. And then Dr. Santana, since you are an international law expert, real briefly, your sense of whether the SDGs are effective at all in addressing sustainability issues. So that is my question to the panel. We will start with Ms. Krishnayya.

Ms. Krishnayya:

Okay, thank you, Dean Klein. Yes, absolutely corporations are paying attention to them. It is one of their best ways to communicate in their corporate sustainability reports how they are achieving impact because that is something that translates whether they are operating in Europe, Asia, Africa, Australia, or the U.S. I think it is one of the best ways to increase the education of folks that are not in the business to understand what impact is. Because the more that

we can bring that to everyone's understanding and that people increase their education and knowledge, the better decisions people make in their purchasing power, as well as having an impact. So, the SDGs are very important to industry.

Chancellor Klein:

Fantastic. So, Ms. Mickelson, how about from a municipal's perspective?

Ms. Mickelson:

Yes, absolutely. The SDGs are incredibly important. As it was previously explained, they provide a common framework for us all to communicate how we are doing. I mentioned that our Thrive Indianapolis is closely related in that it has a pretty comprehensive outlook of where we are focusing our attention and certainly, I have been giving more thought around maybe applying how the sustainable development goals fit within each of our action items. One of the things I am thinking about there is related to green financing. We could be more attractive as a municipality, receive a better credit rating, and whatnot if we do start to align ourselves more closely with the sustainable development goals.

Chancellor Klein:

Thanks, and Dr. Santana from the ivory tower, do you believe that these goals are making an impact?

Dr. Santana:

So, well, a general overview of the SDGs is that it is been very hard for countries to achieve one hundred percent of the goals. And if you see the five first countries in the ranking, Finland, is number one. They have eighty-five percent, Sweden eighty-five percent, Denmark, eighty-four, Germany eighty-two, and Belgium, eighty-two. They are all developed countries that already had environmental policies very strong in their own country. The higher countries can internalize and have hard law within the SDGs, meaning that they make it binding to everyone. The higher the chances we can achieve more goals instead of having soft laws that they are not binding in countries and environmental policy in general. They are very, not close, very good close friends of anyone because it changes the way we do things. It changes our culture. It changed the way business industries; they have to change the way of production. So, because it is not, it has a cost in the beginning that will be worth it at the end, if you can say that we are going to have a good end. I believe that unless it becomes hard law, we are going to have trouble achieving these goals.

Chancellor Klein:

Thank you. Brittany, I am going to let you jump back in now and manage the questions from the audience.

Ms. Doyle:

Thank you. Our first question is open to all the panelists. What can be done on an individual level for us to increase awareness and action towards sustainability?

Ms. Mickelson:

We, in Thrive, have a list of what you can do. It ranges from choosing to drive less, using reusable bags, etcetera. However, you might not be surprised to think policy is really influential and so I would say, be very active in both your local, state, and federal politics. And to vote. Think about where these candidates sit on these issues and then vote someone to office that is going to take the action that you would like to see.

Ms. Doyle:

Thank you. If you live in Indiana, we do have elections this year for state, local, and federal offices, so make sure you are registered to vote. Ms. Krishnayya, would you like to respond?

Ms. Krishnayya:

Could not agree more. Exercise your voice and vote, for sure. But look to get actively engaged in finding a website from the community that you live in to get the knowledge for it. Be more aware of the risk in the areas where you live in, too. Becoming more knowledgeable. Something as easy as buying a home and looking at a FEMA map for where you live. Are you supporting areas where it's not really a sustainable living area for that as well. Our hazards are lower here in, Indianapolis as they are in some other areas, but becoming an informed consumer, and an informed homebuyer and a community activist is very helpful.

Dr. Santana:

If I may say, if I just may add one little thing, share your knowledge on social media. Use social media to be an advocate for sustainability. When you find things out, share with your friends. So social media really helps to spread the knowledge in a very fast and effective way.

Ms. Doyle:

Thank you. Director Mickelson, this question is directed toward you. What impacts will new federal passenger rail spending have on city transit plans as it relates to sustainability?

Ms. Mickelson:

Yes, absolutely. I think I could speak more broadly in the sense of all the federal funding coming down the pike. We are really excited for it and everyone in this space is kind of gearing up and getting ready to go. But we are also kind of hurry up and wait. Right? Like, there is a lot of rulemaking and appropriations that need to be happening. And so, it will make an incredible impact for our city though. No matter what the money is for, we are talking EVs, we are talking rail, we are talking all sorts of things, and these are going to be once-in-a-lifetime type investments that we are all really looking forward to seeing coming.

Ms. Doyle:

Great, yes, as a resident of Indianapolis, I am much looking forward to increased mass transit. Fun tidbit, actually, in 2016, there was a ballot referendum here in Marion County to increase taxes to help pay for the red line. Randomly, I was the voice for that radio ad, so if you were listening to the radio in 2016 and heard someone plugging for you to vote yes on that ballot initiative, that was me, and it passed. Thank you very much.

Ms. Mickelson:

Now the purple line just broke ground, so now we are getting our second VRT line. Big stuff for us is happening.

Ms. Doyle:

Yes. Ms. Krishnayya, this question is directed toward you. It says, I thought water temperature controls were already addressed. Is this goal an enlargement of efforts, improvement of methods, or increase coverage by individual companies or actors that have not been performing?

Ms. Krishnayya:

Really looking at more sustainable ways of implementing those controls. So certainly, in the past, technology has been relied on a lot. And technology is great, but you tend to have trade-offs because you have increased energy demands, which therefore has increased greenhouse gas emissions and other emissions with it. Water consumption is part of it. If you can take natural capital, and what I mean, there are just actual plantings to help you with that and find the multi-environmental immediate impacts from it, that is a more sustainable solution to temperature control versus relying on technology alone. Really just trying to, to look at where can we put technology in balance with natural capital for the solutions.

Ms. Doyle:

Professor Santana, how can states and countries reconcile international calls for sustainability with their own economic growth, especially in communities that are not placed to take advantage of incentives for sustainable initiatives?

Dr. Santana:

Well, so this is a very hard question. Well, my opinion is, we have to make a stronger goal as a society. We have to make stronger commitments as an individual, and we have to better vote. So, worldwide speaking, right? You are going to have elections soon. We are going to have an election here in Brazil this year as well. But we have to make stronger connections to our politicians. What is happening and in countries that are non-developed or developing countries is that let's say now due to the pandemic moment, everybody only talks about reestablishing the economy. So, remember when I talked about that, when we think about sustainable development, you had to think about economic, social, environmental, and cultural. What is happening right now we are forgetting completely there are three other spheres of sustainable development and we are focusing on economics because unfortunately, we are still using the GDP as the main way to measure growth in the world. So, the higher the GDP, the best the country will be in terms of growth. So, we have to change the mindset. We have to pressure to change this mindset. And we have to be better-informed consumers. We do not have to change our phones every year. We do not have to change our computers every year. We do not have to change our cars every year. We do not have to have three rooms of clothes. We have to think sustainably as an individual, so industry and business, they respond to consumers. If you buy a good quality product, you will not be needing to change it every other year. We are going to be making better use of our money, and most importantly, of our natural resources. I do not know if I have replied, but it is a very hard question.

Ms. Doyle:

Thank you very much. All right, that is going to conclude our sustainability panel. For our panelists, there are some additional questions that we did not have time to get to, in your Q and A box, so if you have time, please feel free to answer those. We will have a brief break before we begin our keynote address by Dr. Carlton Waterhouse at the top of the hour at 12 o'clock eastern time. Go ahead and take a quick break and we will be back in about ten minutes. Thank you so much.

INTRODUCTION OF KEYNOTE ADDRESS**Dean Karen E. Bravo:**

Good afternoon, just barely, and welcome back everyone. I am going to take

the privilege of having the microphone to express my pride in our students. This wonderful team of students and Symposium editors for the International and Comparative Law Review for the wonderful work they have done in bringing together phenomenal speakers, such informative speakers for this Symposium shared with all of you who are attending this program. Thank you very much to the students for making us proud. And now to go onward, we have a distinguished keynote speaker who has had a long and illustrious career as an international expert on environmental law and environmental justice. Dr. Carlton Waterhouse began his legal career at the Environmental Protection Agency, serving as the lead counsel of several environmental enforcement cases. He is a four-time recipient of the EPA Bronze Medal Award, in addition to several other accolades. I could go on for many minutes. And Dr. Waterhouse entered academia, eventually becoming a professor of law right here at Robert H. McKinney School of Law, where among other things, he directed the Environment, Energy, and Natural Resources Law Program. After his time here, Dr. Waterhouse began teaching and building the Environmental Justice Center at Howard University. He has returned to the EPA as Deputy Assistant Administrator of the Office of Land and Emergency Management. Last year, President Joe Biden nominated Dr. Waterhouse to serve as the Assistant Administrator. Dr. Waterhouse has dedicated his career to public service and advocating for underserved communities. I am honored to introduce to you our keynote speaker, and I hope I may claim my friend, Dr. Carlton Waterhouse.

KEYNOTE ADDRESS ON ENVIRONMENTAL JUSTICE

Dr. Carlton Waterhouse:

Thank you so very much Dean Bravo for the kind words, my friend. It is really a pleasure to be back in Indiana for this event, though virtually. I have so many friends who are participating in this conference and who are present there. It always warms my heart, and I am very thrilled right now with the opportunity to be before you all this afternoon. Thank you so much to the students who have organized the Symposium and also for the wonderful job you have done in seeing it through. I was able to only catch the tail end of the last panel as my friend Dr. Santana was providing her remarks, but I found those to be really informative and insightful. I will not belabor the point. My name is Carlton Waterhouse. I am President Biden's nominee to be the Assistant Administrator for Land and Emergency Management, and currently the Deputy Assistant Administrator for the Office of Land and Emergency Management. And so, today if you do not mind, I realize with a fifty-minute talk, who wants to listen to somebody talk for fifty minutes on zoom? Right? I figure we need to at least provide some visuals for those of you in the audience that could help expand the different ways that we are able to interact. We will get your eyes involved a little more. I will take this moment to try some technology and see if I can share my screen with you right now.

I am hoping you can see that, and I will put it in presentation mode. This talk

is just an opportunity for me to be able to talk with you about some of the important issues that we are addressing within our office, the Office of Land and Emergency Management specifically, and then within the EPA that I think really relate to some of the very important issues that you are all are addressing through this really insightful Symposium.

So one, I want to take a moment and talk about environmental justice, and then I am going to say a few things about recycling and the circular economy. In that context, in terms of talking about environmental justice, many persons have heard the term used and had some of you may use the term or may have talked about what it means, and after spending some wonderful time at IU, at the McKinney School of Law, I began my time at Howard University running an Environmental Justice Center, so we certainly used the concept of environmental justice in the way we organized our activities as a center and worked with students there. I will take a few minutes to share a little bit about what that meant for us. And it meant for us that we would educate our students in understanding what were the causes of environmental injustices, and what are the solutions that can help to address the injustice we saw in the environment. When we talk about injustices in the environment or seeking and fostering environmental justice, we are talking about the realities that people live on the ground in their relationship to the environment in which we all live. And that means where people live, where they work, where they play, where they worship, and where they go to school.

In thinking about that, I want to talk about the way we frame environmental justice in our exploration of the subject at the center, but even before that, when I was teaching environmental justice and exploring environmental justice issues with the great students and faculty at the IU McKinney School of Law.

When we think about environmental justice, what we should think about is four aspects of life in our society and four ways in which we interact with the environment and institutions around us. So, when we talk about environmental justice, we are talking about distribution of pollution, distribution of the adverse health effects of pollution, and distribution of what we might call the disamenities associated with pollution and contamination. But then we also talk about distribution of the services, distribution of the goods, distribution of the jobs and employment and career opportunities in our society that, in fact, cause adverse pollution impacts. So, what we are saying when we talk about environmental justice, one frame is the distributional frame. On the top side of the coin, is what we might call “the bads” associated with the environment that are caused by “the goods” of certain kinds of activities. So, the certain goods of the activities are the economic prosperity that flows from them, the employment and career opportunities that flow from them, and the goods and services that flow from them.

On the bad side, we are thinking about adverse health effects, the adverse economic consequences, and the adverse psychological and emotional impacts. So, if we have a facility producing a hazardous or dangerous chemical that is

located in your neighborhood, there might be positive impacts by those employed by the facility. If the facility is profitable, there will be positive impacts for those who are shareholders in the company, there are positive impacts. There are positive impacts for those who are employed at the head of the company or maybe running the specific facility. Or the technical people who are engineers and scientists or technicians who work to operate the facility. Positive impacts that they experience as a result of the facility's operation. Impacts that benefit them, benefit the people they love, that benefit their children and others around them, that allow them to have a certain lifestyle. That allows them to enjoy a certain set of circumstances and experiences, educationally and otherwise.

But, in addition to those positive economic benefits that employees and management, and shareholders enjoy from the operations of that facility, there can be another side. And that side can be pollutants that may be regularly emitted from the facility that land in the yards of their neighbors. It could be a haze that actually develops over the entire community or over, maybe, an entire region of the community, or it could be the consequences of having risk to the groundwater that is posed by the pollutants that the facility is in fact producing. Or it could be inhalation of particulate matter that causes and contributes to asthma and adverse asthma effects and contributes to heart disease and lung disease, or it could be exposure to other harmful pollutants that come from the facility. When we talk about environmental justice, one frame is just thinking about the distribution of the positives and negatives of the activities that have an environmental impact. And the example I have given you will show one frame of environmental justice. There is an injustice associated with community members who bear the burdens of the pollution that is being emitted from the hypothetical facility, and there is also a further injustice in that there are people who are benefitting from the facility's operation who do not typically bear the burden of the pollution. So, we have people who are bearing an environmental pollution burden that puts health at risk, diminishes their quality of life, and will they also are not the same people who are reaping the economic benefits and are about to thrive more fully as a person through reaching and aspiring to career goals, having positive benefits on one's investments that produce long-term economic benefits, the miracle of compound interest for shareholders. Right? And so, we can see that we have an injustice in a distributional frame—a distributional injustice. Some have a disproportionate share of the benefits and others have a disproportionate share of the burden. In our society that often is characterized along lines of class where one has a certain economic position or socioeconomic status, puts one on one side of the equation versus the other side, and it can have a racial component. Many numerous studies have demonstrated there are substantial racial disparities in terms of how this scenario plays itself out, or who finds themselves burdened with the pollution, and who finds themselves benefitting from the economic activity that produces the pollution.

When we talk about environmental justice we need to talk about a distributional frame, but beyond the distributional frame there is justice in the context of process. A procedural frame is an aspect of justice. Justice in the

procedural frame means how are people being included in the decision-making that leads to their adverse impacts that they experience from this hypothetical facility. Right? So, were these people able to be at the table to help decide that this facility should be able to locate in their community? That is procedural justice. They are going to be impacted adversely, are they also able to have an impact on that decision. Beyond being able to have an impact on the decision about where the facility would be located, how about decision on how the facility operates? How long the facility operates? What are the pollutants that are coming from the facility? How close the facility can be to their property and their home? Whether the facility is near schools where their children attend. What is the level of procedural justice associated with people who are adversely impacted from our hypothetical facility? That is an important frame around the question of justice—is justice a matter of the process. Right?

We see typically environmental procedures are really grounded in governmental activities, so activity of the federal government, the activities of the state government, the activities of the local governments, and the activity of the facility. Typically, however, people who are most impacted by the facility's activities in an adverse way have little or no voice in the decision-making about where the facility operates, how long the facility operates, and what the level of pollution the facility emits. Those decisions are in the hands of other people. Well, from a very basic standpoint, the community's inability to help drive the decision that is primarily going to have an adverse impact on them and a positive impact on other people, itself represents a procedural injustice. Justice as process.

We also have another frame of justice when we think about justice from the standpoint of recognition. Right? And what recognition means is not just that we have a process for the involvement of communities, but we recognize communities as important partners in the way we carry out all of our activities that have environmental impacts. Right? So, we recognize community expertise. We recognize community knowledge. We recognize community wellbeing at the center of our decision-making rather than just seeing communities as a tangential component of our decision-making. In other words, we are centering the people who are potentially going to be adversely impacted in our process and in our substantive activities that relate to their long-term health and wellbeing. This is an important set of framing principles that I think are critical for thinking about environmental justice. Not just in the domestic context, however. Right? This is critical in the international context, and even though as we get outside of the shores of the United States, and we are not primarily looking at the question from the standpoint of America's fault lines around justice, economic, social-economic status, race, and ethnicity, for example. We look at it in the broader international context and we find there are different fault lines in different places. We find religion maybe. Particular language group or tribal identity. Maybe geography, maybe a fault line in one country or another that determines whether your community is on the adversely affected side of economic activities that have environmental impacts or on the positively affected side. Environmental justice is not just a domestic reality, it is a global reality, and it looks different in

different communities, but on a global context, it is the same challenge. Right? How do we as human beings decide how to engage in activities and processes and orchestrate a process that is going to have different impacts on different people and whether those different impacts can be characterized by who the people are. We know one tribe is going to be the ones receiving the benefits of the activity and another tribe is those who are going to be suffering the burdens of the activity. One might think of, for example, being in Nigeria and contrasting the challenges that have been raised by people who live in the Niger Delta region, Port Harcourt, and other places who are suffering the adverse harms of oil drilling that have taken place there verses the complaint that has been made that the people who benefit from the oil wealth are disproportionately located in the northern regions of the country and we can see how the fault lines existed and had how that framing itself represents a typical issue as they have articulated of environmental justice.

With that said, with regards to environmental justice, I want to move on to say a little more about some of the things we are doing at EPA that I think relate broadly to climate and broadly to issues of justice as well. So when we think about climate, climate should be able to be understood from the standpoint of how people are being impacted by decisions that we are making in a global context because of the environmental consequences of those decisions that are not just discreet within one country or another. One neighborhood or another. One city or another. One state or another. But literally, all over the globe, we are suffering impacts that result from these decisions. And those impacts are seen in weather events. Those impacts are seen in heat island effects in particular cities. Those impacts are seen in wildfires that we experience. Those impacts lead to flooding. They basically lead to sea-level rise that can wipe out an entire island or an entire community or people's homes, whether people live on the coast or live in the midst of the sea. The sea-level rise events are cataclysmic when they destroy homes, and they represent the elimination of habitats and places where people have lived and thrived for hundreds and even thousands of years historically. And when we think about climate change, we have to understand that the impacts of climate change are felt in disproportionate ways which gets back to the whole question of justice. The disproportionate impacts and some groups contribute more to the causes of climate change through their economic activities. Through these ways, they engage in their practices for transportation and for lodging, and for employment. And for their use of technology. You will find one country may have people who have a footprint for the production of greenhouse gases that leads to climate change that is far larger than another country. So, you can see how one country's footprint could be twelve and a half and another country's footprint could be only a five.

Yet, the country that has a footprint of a five in terms of the contribution of greenhouse gases can find itself suffering the flooding, or the heat island effects, or the increased weather events, or the wildfires that are much greater than a country that is a twelve. Right? That gets to one of the matters of climate justice at its core. At the core, we are talking about the inequities associated with harms

and benefits. Right? Harms and benefits.

In the context of the Environmental Protection Agency, how are we leaning into this issue and addressing these challenges? I am happy to say President Biden has prioritized this. Prioritized the issue of environmental justice and he has talked about it specifically, but beyond talk, he has moved to action. One of the things he has done is create an executive order on climate justice. That executive order on climate justice calls for us within the federal government, federal agencies, to take action to address the problems of climate justice and climate injustice. In doing so, one of the signature aspects of that is the creation of the Justice40 Initiative, and the Justice40 Initiative calls for the federal government agencies to decide and to determine where they are going to distribute their benefits and that they do so in a way that sees at least forty percent of the benefits they produce are going to disadvantaged communities. And that is called the Justice40 program and the Justice40 program within the EPA is taking many different forms. It is taking forms of us within the agency to direct our programs and resources in a way that makes sure that disadvantaged communities as defined by the CDQ [Council on Environmental Quality] through their Justice40 screening tool, find themselves beneficiaries of forty percent of the benefits of our operations. Why is that important? Well, that goes back to my earlier discussion about justice in a distributional context, because when you think about the distributional context, there is a disparity in the benefits in the economic activities in our society and the harms associated with economic activities that have adverse environmental effects.

And so we see Justice40 designed in a way to see that the government responds to those inequities in a way that seeks to counter those inequities by providing enhanced benefits for disadvantaged communities. And so that is something we are excited about within the broader federal government. But also, down at the agency level. I work at the Environmental Protection Agency, so my boss, Administrator Michael Regan, has leaned in on environmental justice and made it also a priority. So, within the EPA, we are prioritizing environmental justice in the way we are moving forward to address climate change and to address other aspects of our programs. In fact, the Administrator has directed us to embed environmental justice in all of the work we do. I am happy to say that within the Office of Land and Emergency Management, where I bring leadership, we have done just that. And in doing that, we have drilled down to our individual programs to address environmental justice in multiple ways. One of the ways we are looking at environmental justice is in the context of our actions. We have created an Environmental Justice Action Plan. And that Environmental Justice Action Plan that we have created is available online. It is in draft right now. We are excited about and looking forward to receiving comments from those who are out there and if you go into the web browser and whatever one you use and you put in "OLEM Action Plan." Stands for the Office of Land and Emergency Management. OLEMEJ or Environmental Justice Action Plan and put in the browser and hit return you will find in fact the Action Plan will come up and we will ask folks to grab the Action Plan and take a look and give comments on the

Action Plan because it lays out in detail how we are seeking within our office to address environmental justice in the way we go about doing our work and fulfilling our responsibility to protect public health and the environment.

In that context, we have some programs that are focused on addressing also issues of climate change. In everything we do, we are making sure climate is addressed, but everything we do does not directly relate to climate mitigation, nor does it directly relate to climate adaptation. But some of our programs have a clear direction and a clear impact on mitigation and adaptation. We have been going through the process of analyzing the programs to see which of those have an adaptation effect and we are addressing that right now and advising the Climate Adaptation Plan for the agency that was originally created in 2014. And we are looking at where the vulnerabilities are from climate change that are going to be impacted by our programs and how the programs can help address those vulnerabilities to make sure the way they are carried out continues to be effective and notwithstanding what is coming as a result and what is already here as a result of climate change.

We also have some programs that can help to mitigate the effects of climate change and I am going on to say more on this right now because that takes us to consideration of the National Recycling Strategy and the circular economy that I mentioned earlier that I would get into. Of course, people are aware that waste production has a substantial adverse impact on the creation of greenhouse gases and that waste production, which breaks itself out into multiple aspects. Right? One has to do with the reduction of waste which is food waste. The reduction of waste that is electronics waste. The reduction of waste that is plastic waste. All of these not only have some potential climate impacts through greenhouse gas production, but also they have impacts on our quality of life. The quality of life of our seas, the quality of life of our rivers and oceans. Because we have a model now that is linear when you produce products, the products are used and discarded and then the products become a problem. The waste problem. The circular economy idea says what we are looking to do is create an economic model that says we do not look to produce a product and send it through the linear system and then discard it. That fits in with the number one philosophy for addressing waste that the EPA developed some time ago which is reduction. The first step in the reduction of waste has to do with reducing the amount of waste we produced in the very beginning. Second one is reuse whatever we could reuse. Third is to recycle, and I will say a little more about recycling right now.

We came out with a National Recycling Strategy this fall. And this National Recycling Strategy focuses on ways that we are able at a national level to enhance the quality of our recycling systems. To do that, we identified individual actions that stakeholders can engage in to make sure that our recycling system is more effective. That it is more sustainable. That it is stronger. Also, within the [National] Recycling Strategy, it calls for recognition that recycling cannot get us there. Right? Let me take a moment and emphasize that. We in this strategy acknowledge that recycling is in [itself] not the solution. Recycling is not the

solution to America's waste problem. We need to move from recycling to a circular economy. That does not mean we are throwing out recycling. Recycling has a role to play. But we have got to note this idea of reduction and reuse and recycling that goes back to the earliest principles that says recycling is not the first step, but it is a third option after we have already reduced and reused. So, how do we put all three steps in the process to achieve a circular economy? That is what we are working on now. We are taking comments from people to hear more about how we can enhance circularity through our processes and programs, but I can tell you one thing I am excited about that we are doing is going to be related to the way we use our natural resources and the way we approach natural resources. Why is that? That is because natural resources have a big impact and the way we go after extracting natural resources has a big impact on us in terms of our environmental challenges.

For example, fifty percent of global climate change impacts come from natural resource extraction and processing. That is *huge*. That is absolutely huge. So, we can see how the way we approach natural resource extraction and processing is going to have a huge impact on greenhouse gas production. Well, why is that important? Because if we have a circular economy rather than a linear economy that begins with extraction and ends with waste, we have a circular economy, we begin, rather than with extraction, we begin with waste and we take that waste and we use that waste to produce some product, and as we go around the cycle we come back with waste and new product production. Right?

I was honored very recently in this context to participate in some recent technology challenge awards that we had where we actually provided awards to companies that were showing leadership in this area. And so, for example, we gave out an award yesterday for a company that produces a line of computers with eighty-five percent of formerly-used products, and so, they are beginning with old products. Eighty-five percent of it for that system, and then designing and building everything from that. And so, the sense of reuse, right? We see that we ultimately are achieving great advances on decreasing the need to extract natural resources, and the need to reduce things like plastics and other things in order to advance circularity. What else is important about cutting down on our natural resource extraction and processing? Ninety percent of global biodiversity loss and water stress come from this activity. So, it is huge for us to move to circularity, and of course, eleven percent of global species loss.

What is the circular economy approach in a graphical form? I have already shown you all and mentioned it to you, but if you look at the graphic, it will help you get an even better sense of what we are talking about or what I am talking about when I mention circular economy. So, if you look at the graphic, you can see how we change what the raw materials are that we are using as inputs for economic production, and that is critical. So, if our raw materials rather than mostly being extracted, are coming from products that were formerly produced, then we will see how we are ultimately deriving a circular system. Right? That allows us to go from design to processing, to distribution, and then to reuse and

repair, which is critical. The reuse and repair section of the circular economy replaces a discarding section that leads to the linear—that reflects rather the end of the linear system. So, the linear system will end with the idea of discarding a product whereas the circular system, instead of just discarding a product, says no we want to reuse and repair products, and then we collect those reused and repaired products, and we move forward with products being recycled so that they can be used again as an input instead of raw materials. And of course, there is some waste remains that will come out of the process, but the idea is to go from almost a hundred percent waste from our economic activities to a small percentage of waste with most of our products going back as inputs for new material. This is really, really huge. Right?

If we think of things like the adverse impacts of extraction, or on local communities, the adverse impacts of extraction in terms of health effects. In terms of disruption of daily life, if we go back to our example of what people in the Niger Delta region have complained about. We can see that they complain about flaring, that they complain about oil spills, and what the impacts are is adverse impacts of flaring on their health and oil spills have prevented them from engaging in their traditional activities, economic activities, life-sustaining activities, like fishing and farming. So, if they cannot fish and farm because of the prevalence of oil, and then their health is adversely impacted by flaring, not to mention being impacted adversely by their contact with oil that is in the ground and in the water, in the places where they formerly farmed and fished. We can see then that this idea of extractive industries has had, in many cases, adverse impacts on people's health and wellbeing when not managed responsibly in an environmental context. And so, eliminating and drastically reducing the need to go back and do more extraction has an important benefit in the environmental justice arena. Right? We are taking fewer communities, subjecting them to poor practices of mining or poor practices of extraction, and then we are providing instead the use of inputs from previously used materials that do not put people's environment at risk. And that is a positive movement for us that has not just ramifications that are important in the domestic context, but huge and important ramifications in the broader, global context. Okay, let me move on.

When we ultimately look at some of the specifics of what we are doing, we are developing a new goal that will help us to reduce climate impacts of materials, and we are centering equity at the heart of the way we are moving forward with this work so that environmental justice and equity, as I framed it earlier, is built into our process. From enhanced stakeholder engagement and through designing systems that begin with the idea of recognizing communities, and the importance of communities, and protecting communities, and advancing communities' health, and advancing communities' welfare, and producing good opportunities for careers in green fields. We are trying to center equity in the way we develop our move towards a circular economy. Moreover, we want to make sure that beyond having communities centered and recognized, that we are distributing opportunities for communities in a way that is equitable, as opposed to only having opportunities distributed for people who are not living in the communities

adversely impacted. Our workaround circularity is also being embedded through our environmental justice work so that it is grounded in environmental justice as we advance and develop it.

Moreover, let me say a little more about how we then through our approach are in fact addressing our need for circularity. We have our Circular Economy Strategies Series that we are developing. Part one was the National Recycling Strategy that we already developed, but we have part two which is the plastics strategy and that is a strategy that is going to deal with the problem of plastics. Plastics are a problem. We know plastics are a problem, and we have seen that in our seas, through their pollution, and how plastics have adversely impacted ecosystems and adversely impacted so much animal life because they are disruptive. That does not even get to the discussion about microplastics and its impact on us in terms of our health and impact on animals and the broader ecosystem. So, plastics are a problem that needs to be addressed. There are a lot of different debates on how to address plastics. Some will say we should address plastics through banning them. There is new international work that has happened around that recently where there are a lot of people who want to call for a plastics ban. Some cities have already started to ban plastic. Some ban plastic bags in the grocery store. Some have put a tax on the use of plastic bags in grocery stores. All of this is to try to work towards decreasing our overuse of plastics. We also understand plastics in many items are under-recycled. In other words, we might take those items and put them in recycling bins and there is no market for their use after they have been put into the recycling bins. What happens, if there is nobody who wants to buy that product that has been dutifully recycled by a consumer, and then a local government has set up a system for collection to collect those, and then a recycler has, through good practices and operating procedures, used mechanical and individuals to sort through everything that they have gotten in the recycling bin to make sure that they have it adequately and properly collected, and there is nobody to buy it. Where do we go? We really need to deal with the issue of plastics and all of the materials associated with the recycling system.

Beyond developing that strategy as a plastic strategy, we also are working on a food waste strategy, critical minerals, and electronics strategy. The idea of critical minerals and electronics says it is wiser for us to extract critical minerals in electronics that have been discarded as waste than it is for us to go digging in new places more than we need to. If we can get valuable minerals that we need for our society and technological developments, whether computers or solar panels or other kinds of technology that need to come from critical minerals, we reduce the extraction that we have to do when we use critical minerals for that work instead. So, we are developing a critical minerals and electronics strategy, and then ultimately, we will move on to concrete, wood furnishings, and textiles. Our ultimate goal as written here is to help the nation to reduce waste, to promote circularity, to address climate change, and to advance environmental justice.

Ultimately, we do need your help at EPA in order to implement the actions

that are called for in the National Recycling Strategy. We do not have the authority to mandate that people engage in certain kinds of recycling activities all over the country. We do not have the authority to make people engage in a circular economy. But we do have the ability to make a call, and that is what we are doing, providing leadership and to get the word out about what the best practices are that we can engage in that will promote this circular economy.

Now, let me make a comment about circularity in a way that I think it is important to wrap us up. And that comes to the fact that we have, under the Save Our Seas 2.0 Act, new authority to fund improvements. We can provide leadership through funding, but we cannot apply it through mandating. We have new authority to fund improvements for solid waste management programs and infrastructure. And the Save Our Seas 2.0 Act directs us, by Congress, we have been directed, to develop a strategy to help us improve the nation's infrastructure, and that is what I called earlier the plastics strategy. And we were also directed under that legislation to report on eliminating barriers to recycling, to report on ways to spur markets for plastics, to report on opportunities that relate to innovation, and also to conduct a study on how we can create less plastic waste. So, we are working both in the context of providing funding to move forward on a circular economy, but also we are working in the context of doing research to get an understanding of how we can advance through some of these hurdles that we have towards getting greater circularity.

In that context Congress has, let me say something about the other reports first, and I will move on. We have other studies also other than those that were in Save Our Seas, that we are developing, and that will shine greater light on policies that relate to reuse recycling and conservation and reports that are looking at the impacts of disposal on packaging containers and manufactured goods, and that is an important study we have undergoing to help us understand how our disposal and other changes on these packaging containers and manufactured goods have an adverse impact.

As I hasten to my conclusion, I will note there is a variety of different bills that are in the hopper, but most importantly, I want to talk about the Infrastructure Investment and Jobs Act, which is no longer just a bill. It was signed into law, although we call it a bill. This bipartisan infrastructure law makes a huge investment in the way we move forward at EPA to address the challenges we have been talking about today, primarily through funding our superfund program at three and a half billion dollars that allows us to get the program out of the mechanic's shop and out on the racetrack to move forward to get things done faster and get more sites cleaned up effectively. One billion and a half dollars for our Brownfields Grant Program, which is critical for providing communities with the resources they need to assess contaminated sites, and to clean up contaminated sites, and provide worker and career training. These grants, we want more people to apply to, and I have made it my priority to go out on the circuit and tell as many people that will listen. I am just short of standing on the corner in downtown Indianapolis to get the word out in downtown and in every

city in the United States to let people know we have enhanced funding to get communities the resources they need to clean up sites that do not reach the level of contamination that the state governments and federal government would be involved, but still serve as a weight or a burden on their communities causing environmental challenges to them and leaving property inadequately developed. Right? And so, I am working with my staff to make sure the word gets out that the billion and a half extra dollars means we have more resources for the community, and we are prioritizing the way we use the funds through anti-displacement. We are developing our own criteria to reward people who are going to design grant proposals that are going to help to push back on what often happens so that the community members who live in the community when it is contaminated are then replaced with a new set of community members who get the benefit of the community once it is cleaned up and new amenities brought to bear. So, we want to work with affordable housing advocates and others, everyone who wants to do this work.

But, I am here to talk about the infrastructure, the Swiffer Grants that we have now been provided as a result of our investments that Congress has made, and the SWIF grants we have, which are Solid Waste Infrastructure grants, are to help us do education, materials management and also provide funding for the development of America's solid waste infrastructure. That means communities that are out there and do not have recycling infrastructure and solid waste materials infrastructure. We are given funding that allows us to give resources to people who do not have that, so we are using the funding to give resources to communities who do not have infrastructure now so that they can build capacity in order to better manage the solid waste issues they face. And, again, environmental justice is critical there. We know all communities that are not in the same situation. Whether rural, urban, small town, or big town, neighborhood, we want to make sure everybody has the resources available to make sure they can engage in the best practices that lead us towards circularity, and that has an effective system for managing solid waste that goes from Alaska to Puerto Rico, right? And everywhere in between. But beyond that, we will also, in addition to providing capacity-based grants to communities that need to build capacity, we will provide grants to those who are the highest performing and are using innovative technologies and techniques that reflect circularity, in order to highlight and signal the effectiveness of some approaches that will further us along this critical road that leads to environmental justice and environmental climate justice for all. And so, we are really excited about these SWIF grants. We have the first round of grants that are going out before the end of the calendar year, and those grants will go out noncompetitively to communities that we are envisioning. We have not finished designing the program. We just got the direction and funding for the program this fall, and I do not want to get ahead of my staff. But, we are envisioning getting those grants out before the end of the calendar year and getting those funds to help build capacity and in the following years, providing even more resources, some of which will go towards providing grants to people and awards to people who are doing it right, and doing it well, and doing it in an exceptional manner that should be an example and an

illustration to people across the country of what the best practices are and can be in the move towards circularity.

We are going to build up the bottom and reward and build up the people at the top to help everybody move up. That is our philosophy and that is our approach. It is a circular economy, not for some, but for all. All right, with that said, that covers the bulk of what I wanted to share today. Even though I may be two minutes early, I am excited about the opportunity and so grateful and maybe we can have two extra minutes for questions and answers. Thank you, everyone.

Ms. Doyle:

Thank you, Dr. Waterhouse. It was wonderful a presentation. I personally really enjoyed your discussion on the circular economy and energy approach. Growing up for me, it was all about recycling, but you are right, recycling is not enough. We have to reduce and reuse. We have several questions that came in. The first question is from Max Kelln, he is an attorney in Indianapolis at Faegre Drinker, and he was a panelist for the climate change panel this morning, and he asked if you can address the EPA's use of Title VI funds of the Civil Rights Act to address environmental justice and any modification of that under the Biden Administration.

Dr. Waterhouse:

Thank you so much for that question. I know a little bit about Title VI from my last time at EPA. I worked there from roughly 1991 to 2000 as an attorney, and I was engaged in helping to develop the agency's Title VI Program in the nineties. That is no longer in my wheelhouse, but I can say that within the EPA, greater emphasis is given to ensure compliance. Title VI is something written back in 1964 as part of the Civil Rights Act of 1964 but was not rigorously applied to the environmental context historically, and so, what this administration is doing is emphasizing that that is civil rights law, which means people who live in the states and receive our grants have a right not to suffer the effects of racial discrimination in the distribution of the benefits and services, and I talked about early access of distribution in terms of environmental justice. And so, that is what Title VI is about. We are not changing the statutes. I do not think we have gotten involved in even changing the regulations, but the administration is focusing on the compliance and making sure that our partners are making sure that the people who live in their states are not having resources disproportionately distributed based on people's racial identity. These are basic requests that I think we are moving forward to have conversations with stakeholders and partners in the states on how we can do this effectively.

Ms. Doyle:

Speaking of compliance, one of the other panelists from the sustainability panel, Meghan Krishnayya, she is a Compliance and Permitting Officer, Vice

President of Brown & Caldwell. And she asked how well are state environmental agencies supporting environmental justice efforts from the EPA? And specifically, she says New Jersey and California have strong regulations and the question is do you anticipate seeing more environmental regulations being supported by state agencies?

Dr. Waterhouse:

What an excellent question. The Environmental Council of the States [ECOS] is one of the leading organizations and a leading partner with the EPA in addressing the issues associated with environmental protection at the state level. ECOS has its own committee on environmental justice, and that committee on environmental justice includes representatives from California and other states dealing with this issue and so, I am really excited about the leadership that we are seeing in the states to address environmental justice. At American University, there is a survey going on, a law survey, that looks at all of the environmental justice laws in the states. States are out there passing legislation we have not seen yet from the United States Congress. And so, states are leaders in the area, and we expect to see more legislation and more leadership development at the state level.

Ms. Doyle:

Great, thank you. Touching on what I had asked first is that arguments have been made that one of the reasons the United States falls behind several other countries in terms of recycling is because of lack of education on the topic. I am a nontraditional student and a little bit older than other law students, but we had no recycling programs or anything in my public school system growing up, and it is something I had to learn as an adult. Do you find any credence to these arguments? If so, how can we promote more education in the recycling context?

Dr. Waterhouse:

I am glad you mentioned that. Part of what we have received from Congress in our SWIF program I talked to you about and other related funding is to provide education and to enhance the knowledge that people have about recycling in their community and recycling opportunities. We are really excited about being able to take the fifty-five million dollars per year investment that we have over the next five years to develop solid waste management programs and infrastructure along with the fifteen million dollars per year over the next five years for education and outreach on recycling and source reduction. And so, my hope is that as we invest our fifteen million dollars a year over the next five years, we will see others follow suit in the state and local levels to maximize the benefits of those educational grants.

Ms. Doyle:

Great, thank you. We have had a couple of questions specifically discussing how recycling, there is an argument that recycling is not cost-effective, and one says I read an article recently that the cost of recycling is more expensive than just discarding a product. And so, how will the circular economy approach affect the accessibility of materials and products for different socioeconomic statuses?

Dr. Waterhouse:

It is a good question. Recycling costs like other costs are not static. They are dynamic. They depend on the existing market at the time, in the community where you are. And so, there is no one-size approach that says recycling is the best thing financially since sliced bread, it is the new cryptocurrency, and we cannot say it is horrible, in terms of finances. It depends on the market at the time. And so, we, as consumers, by demanding or asking for products that are made from recycled goods, increase the economic cost-effectiveness of recycling. Our practices as Professor Santana was saying at the end of the last session, our practices relate to sustainability. If we make sustainability a priority in the way we spend money, then we will see businesses prioritize sustainability in the way they develop their products. That as a result, the market has shifted to circularity. We are talking about building a circular economy, not that we are in one. We are in a linear economy now, so we do not reward recycled goods in the same way we will in a circular economy. Really, this requires a shift by all of us, and why I mention that grants help to reward people already doing this to some degree, in a way that running their practices. I think there is hope for that. And as the economy shifts, also the costs and benefits of recycled products will shift, so they are not just at the higher end of the economic spectrum for people to buy, but available to everybody. But we need everybody to be involved. This is an all-hands approach, and we need help from you all to spread the word and engage in your own consumer practices that help promote circularity as well.

Ms. Doyle:

Tactics like planned obsolescence famously advanced by companies such as Apple seem incompatible with a concept of a circular economy. What can the EPA do to combat these practices before devices can reach consumers?

Dr. Waterhouse:

You are absolutely right. I think this goes back to Professor Santana's wonderful comments about the way we buy products. If we reward a cellular phone manufacturer with planned obsolescence by continuing to buy every new iteration they have of their devices, then we are in fact, *we are in fact* rewarding their planned obsolescence. That is *our* behavior. We have to be part of the solution and have to recognize our own engagement as consumers, we can be part of the problem. Right? So, it is not a casting of blame or putting it on one side or the

other. We have a role to play, and they have a responsibility, but they respond to us. In many ways, we at the EPA have the power to use funding and other mechanisms to develop best practices to encourage extended producer responsibility and that causes companies to think about whether they want all of the products coming back to them. We have seen states engage in producer responsibility. And if you take responsibility for every phone that comes back to you, you are going to think about whether you want planned obsolescence because ultimately, it does not become the consumer's problem, it becomes your problem. [Jurisdictions] that put extended producer responsibility in place due to legislation have moved the needle a bit on how companies will think about planned obsolescence and those kinds of practices. We have to politically engage in a way that promotes the circular economy. We have to economically engage in a way that promotes the circular economy. We at the EPA are using the authority we have and the tools we have to promote it, but we do not have the authority to require it. So, we are getting out to try and educate and spread the word to let people know let's work together to move the needle on where we are.

Ms. Doyle:

One final question. Has the EPA looked into programs initiated in countries like Germany where cities and towns are given authority to set up recycling programs, such as providing households with separate bins for collection day for landfills, glass, and plastics?

Dr. Waterhouse:

This is more in the weeds than I normally deal with at a recycling level, but I can tell you people are looking internationally for models and examples and looking to spread the knowledge in terms of the way we provide support for communities. In America, recycling is something very much done at the jurisdictional level and controlled at the local level and that is one of the challenges we have. We do not have one national system. Every local government has the ability to design and set it up in the way they think makes the most sense. What we are doing that relates to that is developing what we think are some of the best practices that communities can engage in that will help move the ball forward for all of us. If we can get communities to work towards best practices, things we learned from Europe, things that we learn from Asia, or wherever we find good practices going on around us, we can help to be good thought leaders in helping to set up a better system for the future. But, you are right. This is all hard. I do not want to give you the impression that it is easy. This is hard, and it takes all of us leaning together, but the truth is, when we all lean together, it is much easier to move the plow. So, I am looking forward to others leaning with us, to put their shoulders against the plow, so to speak, along with us at the EPA, to help move us toward a circular economy.

Ms. Doyle:

Dr. Waterhouse, thank you very much and thank you to all of our panelists. That concludes our Symposium for today.

Dr. Waterhouse:

I did not realize we were wrapping up. I have to recognize Chancellor Klein who is on this call for being such a great chancellor, a great dean, a great professor, running IU's Environmental and Natural Resources law program, as well as being a great colleague and friend. I just wanted to acknowledge him and so many others on this call before I say goodbye.

Chancellor Klein:

You are very kind, Dr. Waterhouse. We just appreciate you giving your time to our school and campus. It means a lot to have you here.

Dr. Carlton Waterhouse:

Glad to be here, Chancellor. It is good to see you in your new digs.

Ms. Doyle:

I want to thank all the attendees for joining. For those of you receiving CLE credits for attending the Symposium, you will receive an email tomorrow with further instructions. While you really only saw my face today on the Symposium staff, there is a small army of women behind me on the Symposium that helped put this together. I want to thank Analiese Smith, Virginia Speck, and Lizzie Ford for all of their assistance. Thank you again, Dr. Waterhouse, and to all of our panelists, for being so engaging and answering audience questions. I hope you have a wonderful day. Thank you.