Stuart Orr

BRIAN: All right. And now for something completely different. It's my great pleasure, to introduce my great friend, Stuart Orr. And I'll go out a little bit on a limb here and make a claim on his behalf. I don't know of any individual on the planet that has thought harder and more creatively about the role that private corporations and investors play in both using water and influencing the use of water. So I think that Stuart's perspectives are going to be, novel, surprising, but extremely interesting to all of you. So Stuart, all yours.

STUART: [Slide 1 – Start Slide] Thank you, Brian. Thank you very much for inviting me here. I think Brian is right. This is something a little bit different. So sit back and relax. I'm glad I'm not doing this after lunch because you would fall asleep possibly. So I'm going to throw some completely different concepts at you as a way of trying to introduce and think about the work that I do in support of my teams that are in countries working on environmental flow legislation, hydropower policy, river basin planning, et cetera, and how my work helps to support them. So I was tasked in WWF about seven or eight years ago to come up with a program of work that could to seek to bring in financial investors, different players, corporations into caring about things we care about. It reminds me of that joke about the kid at Christmastime who every year would pray to the Lord that he was going to get a bicycle for Christmas, and after three years of trying, he realized that wasn't working, so he stole one and asked for forgiveness.

So that's us. How do we game the system to get other people to care about the amazing science that I've watched from you all in the last couple of days? I've really enjoyed sitting here seeing your presentations because it's not that it's new to me; it's just that am working on the other end of it. And I want to share some of that with you today. So, I think about risk, I think about how do people respond to water risk?

[Slide 2 – Mississippi Farm]Now, this farmer in the Mississippi has a pretty novel approach to dealing with risk, but I'm not sure I'd want to have a glass of beer on

his porch. But the point is as we go forward and think about bringing people into our world of water, how do we get people to care about things like ecosystems and environmental flows? How do we get them to understand that actually it's in their best interest too? You have to think about risk. And with risk, it's really important about understanding people incentives, of what really makes them move, and what really makes them care about their own self-interest.

And, we'll talk more about that through the presentation. I work for WWF. I'm sure you all know of course the panda. We are 7,000 people in 92 countries. I've got hundreds and hundreds of people working in freshwater in some very tough locations fighting an incredibly hard battle. Some places we win, sometimes we spectacularly lose, but fundamentally it's about protecting creatures like this river dolphin [Slide 3 – River Dolphin]. And so, we spend our days thinking creatively around how do we make this creature under the water that nobody sees sexy?

WWF is known for elephants, tigers, and things that are iconic with the public. People don't connect very well with fish, as I think you well know. So I think that it's about taking and embedding my work into what you do and ecosystems and biodiversity. It's very easy when you start talking to investors and companies and different people to start being way off on message. , You can send a lot of time having nothing to do with actually changing what it is you're trying to do. So to remind yourself what you're trying to do and why you're in it almost all the time is extremely valuable.

[Slide 4 – woman with water can]Of course, when we talk about risk, we talk about risk to whom and risk of what. I think there is no greater development tragedy in our lifetime than the failure to deliver water and sanitation to people around the planet. Two billion people still don't have adequate access to sanitation, and around 800 million, access to suitable water. That is a horrific statistic. And we know, of course, that countries that invest in water and sanitation see almost a two-point bounce in GDP. There's a direct correlation

between providing healthy water and systems to people, but that is risk. So, think about that. When we don't deliver water in the right way, we talk about it in the sense of fish or social values, but we can also talk about it in the sense of human development and squandered opportunity and lost development opportunities, and girls' education. The single biggest opportunity to reduce global population is to educate girls, but if they've got to spend their day collecting dirty water, we can't achieve that goal. So we can bring water down to seeing perspectives-- I had a friend back in England, where I'm from, who could blame every problem on the world on Margaret Thatcher. I think I can pretty much do the same thing on water, You give me a problem, and I think we can all find our way back to water. Even Thomas Friedman talking about the Arab Spring and the water crisis, people are starting to see these connections in completely different ways. So risk to whom and risk of what is an increasingly important way to frame this idea.

[Slide 5 – Mekong Fisherman] This is a fisherman in the Mekong River. It's a place I do a lot of work. And I'm sure many of you are aware that we're getting to the point in the lower Mekong where the first main stem dam is about to be past a point of no return. The Xayaburi is about a year away from being at that point. And we put on a good fight for many years on the Xayaburi, but we ultimately lost because it was a highly politicized battle. But this is a river basin where 60 million people in the delta rely on fish as their primary source of protein.

Even more importantly than that, these people are extremely poor, and that fish is not just protein. It's lysine, an incredibly important amino acid for brain development. So the dams are -- it's not a flows issue per se. It's a connectivity issue and an issue with fish migration, but it's a fundamental problem that is really hard to crack. Eleven more dams are proposed for the Lower Mekong. There has been a lot of modeling on what that means in terms of impacts.

[Slide 5 – Mekong Fisherman click through]We did some work on this where we looked at dams on the Mekong River, and we asked the question -- we've got science from World Fish, we've got science from the Mekong River Commission, and we know how much fish we're going to lose. So how much land and water do you require to replace that?

Now, it could have been easily we could have done a cost-benefit analysis and we could have discounted fish loss into the future, and politicians could have figured out where they're going to get the money from, but we found a different way of framing the argument. We said no, how much land and water do you need? And where are you going to get it from? And how much land do you have. And actually, we started to find out some really interesting things that actually the agricultural growth rate in both Cambodia, Laos, and Vietnam was at negative numbers. So how are you going to keep pace with food security issues? So we took a dams issue and made it a food security issue. We haven't yet won it, but we have really thrown some spanners in the works here by reframing what impacts mean, impacts of dams on people and fish from a food security, foreign exchange, health livelihoods, development story, and it's getting traction. The point I'm trying to make here is thinking outside of the box a little bit, trying to find out new ways to incentivize people to care about fish is the point.

[Slide 6 – Irrigation spigot] We always talk about agriculture. We always talk about water in ag—70 percent of the water goes out of -- we see the numbers, we know the stories. We seem to forget that the agriculture, almost all of it enters corporate supply chains. Where is the discussion about that? And I heard Mr. Wassermann's talk yesterday. Are you here Mr. Wassermann? I don't know. I really enjoyed that talk yesterday about the tribal areas. And he was talking about the irrigators who don't have permits to irrigate. And he went to the ecology department and put it on the table. I understand that. I see that many times around the world. I've got a team of people in Spain who had that issue with the Doñana wetlands. And what they ended up doing after many years of doing

exactly what I think many of us would do, which is trying to raise it within a sort of political system, he figured out who was buying those strawberries and those potatoes, and he went to the supermarkets. And now we have criteria and European standards say I will not buy or source from farmers that take illegal water or don't have permits.

You can push through markets to get where you want much faster than you can through regulatory regimes sometimes. So, thinking about how you can game it a little bit. [Slide 7 – Industry] So everywhere I go in my network of countries and working with my teams, we can't separate the things we care about—keeping water in the rivers for fish from agriculture and, therefore, corporate supply chains. I also cannot separate industry from lining the banks of our rivers everywhere. Simply everywhere I go, there is industry. So I'm not here to tell you that the private sector is now enlightened and they figured it all out and that they're going to save us. Far from it. There are a lot of companies still doing tremendously bad things to the environment, and you all have great stories about knowing the frustrations of dealing with mining companies and others in your river basins. What I am going to show you though is that there is a trend out there. There is a real trend about this connection between water, water scarcity, water pollution, declining ecosystem, even fish loss and corporate risk. And the job for us over the next five, ten years, is to figure out how to leverage that risk to get what we want. And I think that's what I'm posing here.

[Slide 8 – Cracked earth] Many of you have probably had this already. The World Economic Forum, which is the biggest sort of convening club of the biggest corporations in the world, puts out an annual risk report. This year, their number one risk to the global economy for the next decade by impact is water.

Now you have the largest corporations in the world telling anybody who will listen that the thing that's going to get them before terrorism and before global financial crisis is water. Okay? Interesting. Davos is a town in Switzerland

where every year the World Economic Forum holds one of their big meetings. I remember in 2007 trying to have a water meeting there and we had three people show up. You cannot get into the room in Davos on a water topic, and they have many of them these days. It is packed. And it is packed because as people have been aware of water crises and water issues around the world, they've started to really, document what kind of risks they have felt. And suddenly they started to realize that if they did look in their supply chains, if they did look at their water dependency, they're hearing from people all the time about how they had to shut down a plant, how they've lost a license, how they've been fighting with a community, how people are disinvesting from them for their behavior, et cetera, et cetera. So, that awareness has been kind of embedded within the company.

So, how do flows impact the bottom line? That's a question you have to ask because -- and we'll get to this. Corporations don't care about fish. Let's be honest about it. And we shouldn't convince them of that. We should convince them though that low flows hit the bottom line, and that's our job to show them that.

[Slide 9 – Texas drought] So you could look at Texas, you could look at California, you could look at any number of places in the world of the last decade, where we have seen severe crisis around droughts or even floods and say how have power plants been stalled. We know from the state of Texas, that a number of power plants that were going to be built have now been shelved. These allocations have been changed. Huge commodity price spikes. So the entire cotton community a few years ago had to absorb a 42 percent price spike in cotton because of poor rains in India and a high demand of cotton. They couldn't pass it onto the consumer. It was a huge economic loss to large fashion brands because of climate. So again, drawing it right back to Margaret Thatcher, you can find out that something is wrong.

And of course, insurance and finance. And I'll come on to how they're starting to look at water in a different way, and I think that that's an interesting lever going forward, certainly more powerful than us. [Slide 10 – Asparagus in Peru] There was an interesting report that came out in the UK a number of years ago, about four years ago now, that linked a number of UK supermarkets to asparagus being grown in the Ica Desert in Peru. This is Europeans' winter asparagus supply chain. The problem is that the aquifer that is being drawn on to supply this is declining at a rate much faster than can be replenished, and that's having a huge impact on the wells of poor people in the local communities.

So immediately, this NGO made this problem the problem of a number of supermarkets in Europe, and they really jumped to attention because they do when you shine a light on them. But that question of dependence has really been opened up to them, and I'll come back to this idea of footprints, water footprints, these blunt ideas of water. But nonetheless really helpful in thinking about dependence on water.

[Slide 11 – Investors] And of course, along with this has come investor warnings. And I will share with you some ideas around investor warnings. It has been very interesting talking to the mining sector. I was just talking a few minutes ago with somebody about the mining are the big bad guys. And they are. The mining sector has done a tremendous job of gameing the system very nicely in their favor and impacting the environment in very negative ways.

But there is a conversation going on with mining companies over the last few years that has shifted. They are stopping to see water as something they have to get out of the way and move as a nuisance, and they are starting to say, actually, water is not just a risk, it's an opportunity. Too many companies have faced too many problems in Peru, in Chile, in South Africa around communities licensed to operate, actual legal licensed to operate, huge fines and costs to the point that they are saying we have got to get our heads around this better, we need a better

strategy at this. So they look at what is the value at risk. You've got mining companies with a billion dollars of ore in the ground they cannot get out because there's not enough water. If that ain't a business risk, I don't know what it is, right? You've got investor warnings coming along the line, shareholder concerns. One of the biggest gold companies in the world right now is being sued by shareholders for $6 billion for failure to disclose social and environmental impacts because of water issues.

Okay, so shareholders are stepping up and saying, "I'm not getting my dividend from you because you're failing to do your job properly," okay? Higher costs to secure water, obviously that has impacts as well. And a legacy of bad interventions. The asset mine drainage issues in South Africa are really interesting right now about the role of the private sector is playing and the license to operate that they have lost with the public as they have left the public to clean up the problem. The same thing with above-ground legacies. I met the head of Rio Tinto, who was saying one of the worst's things we did was think that our best CSR opportunity was to provide water to local communities, but then we shut the mine and the communities wondered where their water was going to come from. We suddenly become a water utility. So, all these legacy issues related to them not understanding the resource, the connection to people, the connection to nature. Again, early days. But I'm saying the conversation is shifting. It'll be interesting to see where it goes.

When I started this work, there wasn't a single bank that had anything to say about water. Then in 2008, JP Morgan wrote this report called "Watching water." And it looked at exactly what I'm describing here. How does increasing water scarcity and quality and regulations affect business? And therefore, how does it affect how investors ask business the right questions about what they're doing, due diligence, et cetera, et cetera? Now every bank has a report on water. I think you can't find a bank that doesn't. We some very interesting titles like "The Real Liquidity Crisis" and things like that. So it's very interesting to look at the

literature and the way in which they're framing it. And not every report is exactly touching on things like environmental flow legislation, but it is raising the questions in a way that we weren't even having two or three years ago, which is important.

Then you have people like Eurizon Capital, which is a capital market firm, that is saying—and I am sorry that the text is small, but the end of the sentence says, "The global economy will favor businesses that take a proactive approach to water stewardship." So what they're saying is we don't want to know what your footprint is, we don't even want to know what your risk is. We want to know what you're doing about it.

And so the proxy that companies are looking at is how are companies responding to water? And Michael will talk more about some of those indicators when he talks about the alliance water stewardship. But that question is a really important one. It's also saying that we can start to think about asset classes that reward companies. So every bank has a water fund—desalination, water pipes, et cetera—and they all perform really well. Now there's a discussion about a water stewardship fund. How do we create a fund that people can invest in for companies that are doing good around water? So that's an interesting trend. And then Moody's down there in the bottom right-hand corner has decided to downgrade mining as an investment opportunity because of the amount of money they have to spend on securing water is making them a bad investment. They're not getting their shareholder money back. So it's easy to think that every mine can just build a pipeline at the coast and desalinate water and pump it in, but actually, the investors don't like that that much. So, it's a double-edged sword here. Interesting days. We'll see where this goes. So you can think from a private sector perspective at least of risk in a number of ways. You can think of it as a physical issue, a regulatory, and certainly a reputational issue.

[Slide 12 – Spectrum of Risk] Now, that affects different sectors in very different ways. The way in which Coca-Cola is affected by reputation is very differently than, say, Rio Tinto or a company that probably provides most of the paper on the table today. They have different associations with people and advertising and revenues. So companies respond completely different, and they respond depending upon if their risk is in their supply chain, at their operations, or even if it's in the product use.

We're doing some work with one of the world's largest consumer goods companies. So they make shampoos, deodorants and detergents, and their biggest product is detergent, washing detergent, and their biggest new market is India. And we had a big meeting with their salespeople and their strategy people, and they had this graph showing their growth in India. And these guys in suits thought that they were going to make a billion dollars out of India in the next two years. So we asked them, "How did you make these projections?" He said, "Well, there's lots of water in India." "Yes, but who has access to it? I mean, if you live in Delhi and your water is available for only 12 hours a day. People fill the bath tubs. Are they going to use it to use your product? What about the people in the countryside? They're going to use your product and it goes into a stream." Point being they hadn't thought about the input uses at all.

And all of a sudden, they're thinking, " our growth projections that we sold our shareholders are based on the fact that we assumed that there was 24-hour energy and 24-hour water." Well, guess what? There isn't. So many companies are just catching up with these things that seem obvious to you and me in a way that's really affecting the way they think about strategy, forecasting, et cetera. So it's not just in how much water is there in the river, what's the impact of my asparagus in Peru. It's also what happens when somebody tries to use my product. Really interesting conversations across that gamut, as you can imagine.

[Slide 13 – CDP] CDP used to be called the Carbon Disclosure Project. I don't know if any of you has heard of CDP. They were called by *The Financial Times* the most influential NGO you've never heard of. But they represent $57 trillion worth of investors who are asking CDP to get companies to disclose their water use risk and impacts. Okay, so the biggest companies in the world are getting hounded by CDP to tell them that information. And that information is readily available on these reports, and that information then goes to investors so that they can ask them questions, really interesting questions like how much water do you need to be a company and how much water do you need to grow over the next 10 years. Fascinating questions. And, who else needs that water, and where are you going to get the water from, et cetera, et cetera, et cetera. You can start to see that as investors think about this, they're asking a completely different set of questions. What I think is different about the latest CDP water report is that 70 percent or more of the companies that responded to this identify one or more water-related risk today that affects their business significantly.

And this kind of mirrors what the World Economic Forum is saying: two-thirds of the risk are expected in both direct operations and supply chains and over the next five years. So, again, not flavor of the month, "Hey, we're going to focus on water this year, not focus on it next year." There's a realization that this is really never going to go away, that how they figure to manage their growth through this is going to be important. Most important of course is that almost none of them know how to respond, because how does a big corporation engage with people in the public interest in a river basin? [Slide 13 – Far side comic] Now, some of you may have some good examples of that, some of you may have gone through litigation to get to a point where you have that conversation. But what I'm saying a lot of companies are really trying to frame what is collective action and water for us. How do we start to do that in a way that could be of benefit? But the point is they don't really know how to respond right now. And so, Brian knows because he sees this world that they are all over the place. There are some fascinating stuff that companies are coming up with. And most of it's rubbish, to

be honest, but there's some good stuff going on out there. But we'll get there. It's a long journey, so it's too early to judge.

So we're left with this idea that companies just do not know what to do, right? And so we're in this fantastic position as scientists, as NGOs, we are sitting on the information that is the basis for business and investor risk in the next 50 years. You guys are sitting on it. You know all the stuff you need to know about aquifers, rivers, flows, glacial melt. This is their supply to their factory, to their supply chain, and to the long-term investment. Again, a lot of people are gaming it. There are some bad corporations out there. But I'm making a point: don't misunderstand where you sit in this. There's a very important role here. I learned this from you yesterday, thank you very much. [Neighboring] up, I like this. This is a good term. I'm going to use this one. We put this model together in 2009. [Slide 14 – Shared risk] We wrote a report called Investigating Shared Risk. I call this shared risk. How do I get corporation or a politician to care about the same things as me?

A corporate cares about physical, regulatory, reputational risk, but they care about making money. They don't want to lose money. I don't expect them to care about fish, and I don't think you should either, you should think about how they should care about fish because they could lose money if there are no fish. Government cares about biophysical processes. They've got to deliver on institutions, on laws, taxes, rights regulations, et cetera. They've got an institutional issue, but it's all politics. They want to stay in power. They don't want to do things that are going to be politically bad for them, which is why we have so many problems in so many places, and we know that. And we care about ecosystem health in a general sense, but the point I'm trying to make here is that we actually need so much of the same thing. We need good laws, we need good regulations, we need stable data, we need an understanding of flows, we need good regulatory frameworks, we need to make sure that those doing bad are penalized and those doing good are rewarded.

We actually need a tremendous amount of the same thing for very, very different reasons. So can it be the beginning of a conversation? And I have seen with my team in a number of places in the world where this has come together perfectly, where we have been able to make the business case for river basins based on economic activity from companies, and at the same time companies realizing that their ability to live in these places and to work in these environment is to work with local farmers and make sure that flows are right and the allocations are right, et cetera, et cetera, and that if they're breaking the law that actually that hurts their ability to do business. I have seen this come together in very fascinating ways. So, what are companies doing? [Slide 15 – SAB South Africa] SAB Miller is the world's second largest beer company, South African Brewer Miller beer. They're based in South Africa. This is some work that they did early on where they looked at their water footprint and they said, "How much water does it take to make a beer?" How much water does it take to make a beer? Does anybody know? I'll take some guesses. I think in liters, sorry. All right. So it doesn't make any sense.

TOM: Times four.

STUART: Times four. Now, 147 liters to of water to make a liter of beer in South Africa, right? Because you've to think about the hops, you've got to think about the barley, you've got to think about the inputs. **A**nd so, SAB miller was the first company to write a report and publicly say that. It was great. And I remember being with them when they launched the report at Stockholm Water Week and I was standing next to the head of Pepsi corporate social responsibility. And 10 minutes after that report came out, a shareholder texted him and said, "That's what I want to see." That quick. So again, companies are exploring these tools that have come on the market. We know that water footprints blunt and misses opportunity costs and impacts and all that, but forget about that. To people who haven't thought about water, it helps them think about how much water they use. That's a great question. So, SAB is running around and saying, "How does our water use within South Africa and our relationship with farmers affect the reserve

in the South African water law? How does that impede the water needs to go to poor farmers?" part of South Africa empowerment policy. Really important questions. And leads them to a more strategic future**.** I think SAB is doing some of the best work on water anywhere. Michael will talk more about this, the Alliance of Water Stewardship. [Slide 16 - AWS] So Brian alluded to this morning how do we start to create standards at a site level that can be a market signal so that an investor can say, "Okay, I'll invest in you, but I want you to have the AWS. That's an assurance for me that you're getting your ducks in a row." That kind of signal. So again, I'll leave Michael to explain that.

[Slide 17 – Water Risk Filter] We had a German financial institution named DEG. They are a private finance sector arm of the German government, so kind of like the other IFC, International Finance Corporation. And they basically came to us and said, "Okay, you're doing all this great work on risk. We want to understand the risk to our portfolio so that we can invest in our clients and build technical assistance and due diligence in all the things we should do on a water perspective." And together we created this water risk filter. It's an online, freely available tool. Brian has been on the advisory council making sure that the science of this is good. We have 91 basin indicators in this tool, and any company, you can stick your factory level in there and you will get an overall risk score. And you can also answer the questionnaire and get a company risk score. Now, it's not perfect, it doesn't drill down to the exact level of a basin. But for our purposes, getting companies to think about water use and strategy and start to move forward on it, it's crucial. A hundred thousand sites have been assessed on this tool now, and we haven't done them. Companies have gone on, investors have gone on, and they've looked at their sites and they've put the information in there, giving us an ability to show them what their risk score is. And we look at physical risk, ecosystem risk, regulatory reputational, risk, different indicators.

We are having conversations with the Chinese Banking Regulatory Commission, the banking regulator in china that regulates all foreign and domestic investment

about how they want to use this as a screening tool. So that's where this stuff is going. Is environmental flows in here? Yes, at the very, very top level. We're trying to use the best data we can just to get it on the table. And as companies get down into the base and we can start to really aggregate your work up into this so that we -- and I saw the California tool yesterday that Beverly showed, really interesting localized information that can connect into this. So just to say tools on the market that allow any company within two minutes to understand 91 indicators of basin risk anywhere in their supply chain. There's no reason that every company shouldn't be able to do this. And so, investors are saying, "Use the water as filter tool, tell me where your risks are." So we're putting the tools out there to make it almost impossible to opt out.

[Slide 18 – Value at Risk] So, the discussion over the years has gone from this water footprint to what is my impact to what is my risk to now what is my value at risk, how much money do I lose when water stops coming in my factory, how much money do I lose when there is a price commodity spike? And so, as we go forward, there is a lot more granular information getting in. And I'm not going to get into the details here, but just to say a lot of people working on this part of the equation now. So you're also starting to move water from the social corporate responsibility into the business strategy guys. You're taking it to the people who make the procurement decisions and the investment decisions and the CapEx decisions and saying, "This is where your risks are, and this is what you've got to start thinking about," okay?

[Slide 19 – Stewardship Steps] We have put together this framework about how companies think about water and respond, and it's basically knowledge of water awareness, just understanding this conversation. And they have come a long way. Again, 5, 6, 7 years ago, it was just a handful of companies. We have gone from almost nothing to the number one risk to the global economy in less than 6 years. The awareness in the private sector is massive. Then it's knowledge of impact, what is my footprint, what is my risk, the tools out there that they can use to get

some sense of their connection to things. And in a very blunt and somewhat distant way—and I am going to come back to flows, their connection to flows—because those indicators are in there. We're starting to embed the environment. It's interesting to note that Brian and I, we're really two of the early people in these conversations and our NGOs were the only ones talking to these corporations. We were able to get environment in there really quick. It's only now that the social NGOs are starting to come in with the water and sanitation work and the human right angle. So we've had that 5 or 6 years to really get the environment in here, and we need to take advantage of that.

Internal action, setting targets and goals and objectives about how they're going to work with their own supply chains. And then these last two steps are outside the fence line. So the one thing we hear from companies all the time is, "I can be hyper-efficient, I can have everything in line, I can be compliant, but if things outside my fence line are falling to pieces, I still have high risk." As the guys from H&M say, "I can't be a clean fish in a dirty pond," because if things out there are still bad, I still have really high risk. So it's not about responding to carbon, where the issue was reduce your footprint. Companies can reduce their footprint. That doesn't reduce your risk. It may even increase it. So it's getting their head around what's my role outside the fence line in collective action and influencing the governance of water at the level at which we want to play at. That's where the conversation is going. So it's how do you take the awareness not just among global companies but all companies and start to think about the role of water in the economy in these basins? And that's a lot of the work we've been doing. Again, a lot of water world has been focused on water for the economy. The infrastructure required to deliver water to multiple needs. Our look is saying, "Well, how do we want to use water through our rivers because of the ways in which we're generating GDP or foreign exchange or beneficiation through the market?"

[Slide 20 – Connection to Flows] So shifting a little bit of the thinking about the role of water in the economy. So, back to flows. My team in Zambia is a fantastic team. They work in this little green area in the middle called the Kafue, which is, if any of you know the Zambezi system, it's a very important Ramsar wetland in the middle of the Zambezi. [Slide 21 – Kafue slide] The upper part of the Zambezi by the DRC border is the copper belt. This is the area where the mining sector really lives. So downstream of the copper belt, the Zambezi goes through the Teshiteshi Dam, thenit goes through the Kafue Wetlands, and through the Kafue wetlands it must go through the Kafue Gorges Dam, which is not only the water to Lusaka, the capital, but it also goes downstream to meet trans-boundary water agreements downstream. So there's this huge need for the water to pass through the Kafue.

So the Kafue is 50 percent of the national hydropower, 25 percent of national maize production, 7 percent of the national fishery, and 20 percent of the national beef herd, 90 percent of their sugar industry, and 73 percent of the urban/rural population. So you've got this confluence of all these vested interests in a fragile ecosystem, and every single one of them has the same need and desires to make sure that that ecosystem functions. So it's that discussion about how do you bring these guys around a narrative to understand this. So we know the flows. We know the seasonal flow. We understand what we need to do scientifically. The point I'm working on is what are the incentives? How do I incentivize people to care about this? Because again, as you know better than anybody, you know how hard it is to push this uphill sometimes. So let me make it somebody else's business. So then we go talk to the hydropower people and we have conversations with the grazing of the cattle, huge part of the Zambian economy. And then of course we need to make sure we've got water coming through in March for the [mimic] flows for the flood retention agriculture.

Then you've got the sugar industry. Ninety percent of the country's sugar comes out of here. That's the supply chain of just about every company you can think

about. They all buy that sugar. And then you've got the Kafue, you've got the water to Lusaka. And the water to the Lusaka is going to grow. They need to take more water. So now you've got competition between the cities. You can see it. It's all there. [Slide 22 – Kafue flows] So, bringing these actors together, you're able to have a conversation around risk narratives, around livelihoods and ecosystem functions, something we understand, link that to Lusaka and industrial needs of Lusaka's city and their need to grow their economy, linking it to the hydropower mining sectors and agriculture.

[Slide 23 – Kafue narratives] And what's interesting is that when you bring these people together, not only is it the first time they've ever sat in a room together, but they completely understand that they're in it. It's the neighboring up. It comes together right here. I see it. They're sitting there. Zambeef is sitting there with Elovo Sugar and saying, "Man, why haven't we spoken before?" And they're sitting with a hydro guy and the other hydro guy and the water minister, and all of a sudden this conversation is going on about how do we make sure we don't over-allocate the system, how do we make sure the permits ae lawful and mindful of the water we have? And then you start hearing people from companies talk about flows, in very top line. But that's what you hear. And by linking it to the regulatory, physical kind of risks that I laid out before, you can start to link these people together in ways that they have just never been linked together. Again, the conversations are there, the markets are there. And then what we've been doing is we've been mapping out who's been buying this stuff.

[Slide 24 – Narratives]So we've been going to the supermarkets, to the buyers, to the big bulk buyers and the smaller companies, and of course now they're putting pressure on this. And so, everybody wants to come together and sort the problem, but they're doing it through markets and risk and long-term viability. I think it's worth noting that there's just a tremendous amount of work out there connected to what you do that I'm sure you don't see, and here's just some examples.

[Slide 25 – Reports] There's work with the German government on public-private partnerships with the private sector on water futures. There's the United Nations putting together renewed partnerships for developments—what's the role of the private sector in the delivery of the sustainable development goals, for example. You've got the World Economic Forum's work looking at partnerships, other work down there looking at the role of water within the South African economy. Principles for responsible investment. Again, turns of investors wanting reports and indicators on what is agricultural supply risk. The International Council for Mining and Metals has put together a water stewardship strategy. I suggest you take a look at it. Twenty-four of the largest, most powerful mining companies of the world signing up to change their mindset about how they're going to engage water. So again, things we can hold people accountable for. And on our own work on water stewardship linked to the private sector. So all of these kinds of things going on out there to influence these new actors but fundamentally to all lands in what we're talking about here today.

[Slide 26 – Moon] I think it's easy to turn any of these discussions into supply-sides solutions. "We can build some more technology." Companies are always thinking about technical innovation. What I'm hearing in conversations all the time is that they realize that there is a technological limit to what they can do to manage their risks, that actually, the only way that they will be able to manage their risks in the long term is to engage outside the fence line in a cooperative way. They are going to try and game it as much as I'm trying to game it, and we know that in places like in Canada and other parts, companies have had a wonderful time dismantling legislation. But I can tell you in other parts of the world, it's another story. And there's some really interesting trends. And if I think about how much we've changed in the last 5 years, the next 5 are going to be a fascinating ride. And I hope you guys can connect your world to that. So, there you go. [Slide end slide]

BRIAN: So Dave [Roskin], is there a cowboy term for the situation in which somebody's sitting in the saddle and they invite somebody else to jump on the back of the

horse? Well, I think you all understand why I've enjoyed taking a ride with the likes of Stuart Orr and this next speaker, Michael Spencer, who's going to build on some of this and share with you some ideas that have come from a coalition of conservation and social interest groups that have come together to try to think about incentives, devices, standards to try to move more and more companies down this progression that Stuart just described so fairy and so comprehensively. So Michael, it's all yours.