



CLIMATE CRISIS: STRATEGIES FOR THE FUTURE

The hazards of climate change can be disturbing to contemplate. But we don't have the luxury of ignoring them. The scientific and investment communities both play a role in urging society to embrace climate solutions.

Bernstein's Ripple Effect Conference on April 22, 2019 explored investors' response to the latest climate change research. Panelists included:

- **RADLEY HORTON**, Associate Research Professor, Lamont-Doherty Earth Observatory at Columbia University
- **ERIC GLASS**, Portfolio Manager, Fixed Income Impact Strategies, AllianceBernstein
- **DAVE WHEELER**, Senior Research Analyst, Thematic & Sustainable Equities, AllianceBernstein

The panelists spoke before a multigenerational audience of investors who care deeply about addressing climate change in their investment portfolios. The following excerpts from the event have been edited for clarity.

To start off, Radley helped frame the discussion by sharing some of the latest research on climate “tipping points” while sounding a hopeful note about society’s response.

RADLEY:

Some of the high probability things that we basically know are going to happen—we know that sea level rise, for example, is going to lock us into much more frequent coastal flooding of a lot of our assets. But also, there's this notion of the lower probability, but really catastrophic events that are going to happen.

We sometimes refer to these as the tipping points, right? Those parts of the climate system where—as we increase greenhouse gas concentrations, as we up temperatures—we run the risk of changing a key property of the planet in some fundamental way. That then leads to further warming and further change, even if we somehow pulled back the greenhouse gas concentrations.

You don't have to invoke extremes of future climate change to see our vulnerability. Already, there is far more frequent coastal flooding. If we go to the future, we can talk about the best-case scenario—even if we got lucky, only had one or two feet of sea level rise, even if hurricanes didn't get any stronger, no increase in nor'easters. And you can see with just one or two feet of sea level rise, there are a lot of cities just about everywhere along the US coastline that every year or two could be experiencing that high-water level that used to happen once every hundred years.

We're locked into this. We're not invoking any worst-case scenarios. This is something we have to plan for. We don't know exactly how the climate system is going to respond. We don't know for sure at what point we will have melted so much Arctic sea ice—a very reflective surface which sunlight bounces off from—at what point has so much of that disappeared due to the increase in greenhouse gases that we hit a critical tipping point. Or there is no longer enough sea ice now, so that so sunlight is getting absorbed by the dark ocean, that we get further warming, melting more sea ice. That's a classic tipping point.

These things are incredibly difficult to moderate, so it's a model because we're moving outside the experience of what we've actually known in the past. And so we need to keep that in mind when we're thinking about modeling the climate system, but also all the impact sectors that you guys think about every day. The further we push the system, the bigger the potential for surprises—and a related element—correlation across extreme events. When we start to think about what if different bread baskets around the world start to experience heat waves and drought at the exact same time or more often? What are the nonlinear impacts on food security, food prices? That is one example of potential threats to insurance systems. Or if we see sequences of extreme heat waves after the power has already been knocked out, for example, by a hurricane.

But fortunately, there's a lot to feel good about, too, because I'm believing more and more every day in the societal response. This notion that there, too, we can see rapid uptake of a world with major reductions in greenhouse gas emissions. Maybe even capturing more and more carbon emissions and an increasing appreciation of how vulnerable we are to extreme weather and climate change. The investing dimension is sort of forcing everyone to have that climate conversation. So, I think between the youth movement—and also the mainstream thinking about this climate risk—we're really in a position where even though the climate news is frankly more negative than a lot of what you hear, I think the societal tipping points still can get us out of this conundrum.

As Radley transitioned to solutions, the discussion turned to the small, everyday steps that concerned individuals can take to help protect the environment.

RADLEY:

I think the first thing to highlight is trivially simple. Just communicating about it, having the climate conversation with people. Not being shy about discussing climate with folks who may be skeptics, as one example. Really just forcing people to talk about this major issue that's going to impact all our decisions long term—and that can offer so many benefits if we do engage around it. Taking on climate can help deal with other injustices that exist in society, for example. So, first, just making sure that climate in whatever way—because it connects with everything—is part of what we talk about and isn't ignored. That can be part of a tipping point.

Flying less is an important one for a lot of people. Decisions we can make at home to make sure that we're using renewable energy either directly, or sometimes we have to get it from other sources.

Individuals can change their behavior, but to achieve true scale we must work with corporations. Our investment professionals—Eric and Dave—each discussed how their respective portfolios help bring about systemic change. Eric led with his approach to impact investing in municipal bonds.

ERIC:

On the bond side and so effectively as an investor, what we do is we invest in underserved, and historically marginalized communities. Each one of our investments has a specific intention. So, for example, when we're investing in school districts or education. We want to reduce the achievement gaps between have and have not institutions and invest in institutions that have done that. When we invest in healthcare institutions, ultimately, what we're trying to do is to reduce the death gap, or disparity in life expectancy, that exists between people who are in wealthy zip codes and people in poor zip codes.

We do that through investing in safety net hospitals that are addressing the social determinants of health. But the whole idea here is that we have metrics that we follow over time to basically evaluate the impact that we're making.

You asked before about things that we can do to move the environmental needle. My suggestion is mass transportation. It's a fact that the carbon footprint of someone who uses and has access to mass transportation is 25% of a person who does not have access to mass transportation.

If you think about the MTA—it's a perfect example of something that drives people crazy. Every line breaks down every day. Just relax and think about all the environmental impact that you're having. The MTA is responsible for avoiding 15 metric tons of greenhouse gas emissions on an annual basis. That's three to four million cars off the road because of the MTA. Right? Think about the social impact of the MTA.

And for the most part, it works pretty well if you think about it as a 24/7, 365-day-a-year system. In terms of things that we can keep doing, mass transportation is really easy and it's incredible the impact that that has on this community.

Dave added his insights from managing a global equity strategy aligned with the UN Sustainable Development Goals.

DAVE:

Climate change is a scary thing. The permafrost holds so much carbon of basically long dead, frozen, living organisms. The ultimate tipping point is if we warm the planet so much that that starts to melt and maybe even some of the icy sediment underneath the deep, cold Arctic Ocean. Could we lose control of the narrative in terms of the carbon side of things? Where that starts to melt so fast that even if we were to cut our carbon emissions by 100%, we've now sort of locked into a runaway?

I think the good story here is that there are solutions. The technology is here today, and the affordability of that technology is here today. So, if you think about it, we have two elements of climate change: mitigation and adaptation. And mitigation just means let's put less carbon dioxide in the atmosphere. And in order to limit to a two-degree scenario, we need to cut carbon emissions by basically 100% by 2050. So how do we get there? You have to decarbonize power generation and transportation.

Vestas is a company that's instrumental in doing that for power generation. They make wind turbines. Wind power used to be very expensive. I started investing in renewable energy about 15 years ago, and renewable energy was a luxury, it was expensive. Today it has become cost competitive with traditional sources of power like coal, gas, etc. The cost of wind power has come down 60% in the last 10 years because of technology, advanced materials, and software systems. So, for example, the average price of wind power in most places is around four to five cents per kilowatt hour. I pay about 15 cents on my bill in Connecticut, and I think New York City is even higher. Here's a company that's producing equipment that can generate power for four to five cents. And the market for that is about \$200 billion spent on wind power each year.

And we think it's going to grow to \$600 billion a year by 2030. So, it's a market that's going to triple and that's one part of our job as portfolio managers—finding the winners when you have growth opportunities like wind power.

We also have an investment in a company called DSM. It's a Netherlands-based specialty chemical company and they do two things that help address climate change in food production. They make enzymes and cultures which makes agricultural productivity better. So, the same field produces more crops. The enzyme or culture is also introduced in food production and helps reduce food waste by increasing the shelf life.

And my favorite is they have a ham product called clean cow. It's a probiotic for cattle. 39% of greenhouse gas emissions are from methane, which is incredibly powerful. Clean cow reduces methane emissions by 30% from cows. And it does not come out the cow's rear. It's 95% perfect.

But part of the challenge of climate change is dealing with risks that are unforeseen—like flooding and drought. Dave also discussed that aspect of his global equity portfolio.

DAVE:

As I mentioned, there are two buckets in climate change. One is mitigation of carbon emissions. The other is adaptation, which can span things like water management, extreme weather, and flooding. It can also affect things like drought in agriculture and flooding and banking. I think a great example that we have is an investment in a company called Xylem. They ensure safe water supplies to communities around the world. They help treat polluted water and recycle it for places that don't have enough water, like Cape Town, South Africa, which almost ran out of water.

Xylem also has equipment to manage extreme flooding. Xylem is a company that provides the equipment and Eric's portfolio helps raise the money for cities to spend on that equipment.

The reference to Cape Town's severe water shortage raised the issue of planned abandonment. Will governments coordinate wholesale relocations away from uninhabitable areas someday?

DAVE:

In terms of planning abandonment, Cape Town, South Africa, a city of 4.5 million people, was probably pretty close to abandonment. They had done the rationing thing. They were already down to low hygiene levels of water—25 liters a day. If I flush my toilet twice, that's 25 liters. So, it was going to be a health crisis. The population has doubled in Cape Town. It looks like Southern California. It's an incredibly beautiful place and it's blessed. And there was going to be abandonment there. So, there could be a planned abandonment.

ERIC:

We talk about the environment and we tend to think about that in a silo. And what I think we've lost sight of is that there's environmental and social justice. I think it's really, really important to think about the impacts of climate on specific communities. On black and brown communities, climate change has a much bigger impact than what those communities are producing. And we have to be very cognizant of that. And we have to inform society as to what these risks are and what the options are.

RADLEY

Who gets the buyouts? What helps to determine that? Who gets left behind? Where do people move to or are there going to be some opportunities in new places that could bring economic development? Maybe too, these are conversations that are starting to happen. We're really trying to have this full societal discussion.

This type of intervention highlights one way governments can have a major impact on an issue like climate change. But it can be difficult to sustain a unified policy stance long term. That's why our panelists were heartened to see other stakeholders stepping in to fill the void.

DAVE:

I think the good news story about climate change—and I talked a little bit about the technology tailwinds—is that while it would be very nice to have national governments all around the world prioritizing this, it's not going to be universal. There will be ebbs and flows depending on who's in office. But the baton is being picked up and it's being picked up by states to a degree. But it's also being picked up by corporations.

It's really being picked up by investors and it's being picked up by individual consumers. We talked a little bit about investment operators. I think there are a lot of investments going on. There's so many companies around the world now that are committed to reducing their own carbon footprint and decarbonizing regardless of what someone in Washington, DC says.

The discussion ended with a question about the long-term implications for stranded assets. There's a theory that some carbon reserves—which some value at upwards of \$25 trillion—may become noncompetitive as the cost of generating renewable energy catches up.

DAVE:

The stranded assets for energy companies, oil and gas companies, I think there's an energy transition. The levelized cost of energy economics drives the boat. And we haven't even imposed a carbon tax in most countries in the world. When you impose a carbon tax on oil and gas or carbon emitters, that's going to raise the price of that even more. I think 75% of big oil and gas companies' reserves will be left in the ground. That's kind of the ballpark for the two-degree scenario. That's not, again, that's not my number. So I think that's what's going to happen. I think we're going to decarbonize transportation and power generation and it's going to happen over 25 years.

DAVE:

And by the way, the oil companies think that too. BP, Total, Shell are talking about spending 25% of their capital on renewable now. And so, just like Netflix moved from mailing your CDs and now they stream it. They transitioned, and the energy companies will transition. I don't think it'll be a financial disaster. Innovation happens in markets all the time. That's what capital is for, and that's what investors are for is to help companies make transitions when they're facing challenges in their businesses.

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