Mike Toffel: This is Climate Rising, a podcast from Harvard Business School, and I'm your host, Mike Toffel, a professor here at HBS. Today's episode is the first in a series where we're exploring how artificial intelligence– or AI–is helping companies address climate change.

In today's episode, I'm talking with Hamid Maher and Charlotte Degot, two Boston Consulting Group partners and managing directors. I'll ask them how BCG is developing and deploying AI solutions to help companies pursue mitigation and adaptation. I'll also ask Hamid and Charlotte how they pitch their work to prospective clients and what advice they have for those interested in working at the intersection of business and climate change.

Here's my interview with Hamid Maher and Charlotte Degot of BCG:

Charlotte and Hamid, thank you so much for joining us here on Climate Rising to discuss the intersection between climate change and AI. It's a pleasure to have you here.

Charlotte Degot: Thank you, Mike, for inviting us.

Hamid Maher: Thank you, Mike. Really happy to be here.

Mike: Let's start with introductions. Charlotte, can we start with you? What's your role at BCG and how did you get there?

Charlotte: My role at BCG is managing director and partner. And specifically, I focus on sustainability tech topics. And within that, I work on helping large corporations, BCG clients, reduce their emissions at scale. I help them with tech, measure better their emissions. And I help them identify the right levers and the right action plans to reduce their emissions at scale.

Mike: Okay, great. Thanks. And Hamid?

Hamid: I'm a managing director and partner at BCG in Casablanca, Morocco. And I'm leading BCG X in Africa and I'm focusing on climate analytics worldwide.

Mike: How did BCG get into this area of climate change and AI? Hamid, do you have the backstory?

Hamid: BCG has been quite active working on social impact topic and on climate topic on the strategy side.

And more and more, we realized that moving to action was actually becoming critical for both corporates and government. And to move to action, we were facing huge challenges in terms of managing the complexity of the climate problem, not only on the mitigation side but also on the adaptation and resilience side.

And facing this complexity, we started to mobilize our BCG X team to try to break this complexity, accelerate decision making, and support our clients and help them move to action.

Mike: Got it. And what's the X in BCG X?

Hamid: The X in BCG X is the focus on product, the focus on technology to accelerate the implementation of strategy, try to innovate and have more impact.

Mike: I see. Charlotte, you work on the mitigation side and you mentioned through measurement. So can you talk us through that practice and how AI helps you with measurement, and how does measurement translate to mitigation?

Charlotte: Sure. We are at a stage where we know that if we want to continue to comply with the Paris agreements, we need to basically reduce our emissions by 50% by the end of the decade. But the starting point is actually to know what are the emissions, what is the footprint of the company, before starting to actually reduce those emissions.

100% of my time is developing and implementing a solution that is called CO2 AI, which is a software solution that helps companies with potentially very complex carbon footprints because they operate globally, because they have tens of thousands of suppliers, et cetera, et cetera, help those companies measure accurately their emissions, leveraging artificial intelligence.
So what you try to do is basically measuring emissions in an accurate, in a granular manner and then help companies identify the right action plans, the right abatement levers, the right trade offs between cost and carbon to be able to accelerate their decarbonization journey and get as fast as possible to net zero.

Mike, you ask the question about where artificial intelligence can help, it's a massive issue to measure carbon at scale for a large company because you don't have sensors everywhere, so you cannot have direct data about carbon. So there is a lot of extrapolation. So there

is a lot of data gathering activity data from ERP systems, et cetera, that you need to transform into as accurate as possible estimations of carbon emissions.

It's so much data, it's really the territory of artificial intelligence. It helps structure the data, mitigate for missing data, do calculations at scale, finding the right emission factors to match an activity with the right emission data that corresponds, do also some forecasting, because what matters is not only the footprint that I had two years ago, is how it's going to evolve based on my business evolution.

And last but not least, AI is very good at helping companies that have potentially thousands of initiatives to put in place to steer down net-zero roadmap to identify the best combinations, the best abatement levers to put in place to optimize this journey.

Mike: I see. So if we think about this measurement question broken down into the various scopes, scope 1, the onsite emissions, for example, of your boiler, like that's fairly straightforward for a lot of companies to calculate. But scope 2, a little more difficult, you need to know emission factors about how intense your grid electricity is, for example. And as you point out, you can be helpful there not only for today's grid mix, but also forecasting based on how quickly the grid is greening based on regulatory and other pressures. Is that right? So for scope 2, sort of it's a forecasting play.

Charlotte: Exactly, exactly.

Mike: Scope 3 is the Wild West as we would call it in the US. Companies break that up into upstream and downstream, upstream referring to the supply chain, and downstream refers to the use and disposal of your products. Let's take those one at a time.

So on the supply chain side, folks are looking to see, "Well, how carbon intensive are the various ingredients that I procure?" Those could be raw materials like steel or it could be componentry. And often, I think they're using some sort of tool, like a software tool that uses averages or maybe they're asking companies for their own data. How does your approach go beyond that on the upstream scope 3?

Charlotte: The way we approach it in CO2 AI is first, basically, even if you do estimation, try to do estimations that are of good quality. I'll give you one example of one of our clients, a wine and spirits manufacturer.

They used to calculate their scope 3 emissions on glass, which is a big bucket of emissions for them for all the bottles that they use for their wines. And they used to

calculate in terms of emission, depending if it's a thin glass or a green glass. And here, f you're not able to distinguish by type of designs of your bottles, by color of the glass, by country of origin of the suppliers, et cetera, you are stuck. You just don't know where to start acting, so that's one.

And the second thing that we are also very honored and proud of is the fact that we are partnering with CDP, the Climate Disclosure Project, to cobble together a platform a part of CO2 AI, that allows to collect primary data from suppliers and to incorporate that into the carbon footprint of a corporation. And that allows to progressively move from estimations to more and more accurate estimations. And finally, primary data from the suppliers.

And the goal is really, and we are doing it with CDP because there is a ton of standards to be defined along the way, and CDP is truly helpful in defining the standards and then making this platform available to the world to make it the reference platform and to accelerate the decarbonization of supply chains.

Mike: What I'm hearing is you're going well beyond averages to try and understand what are all the sources of variation, for example in glass, the color of glass or the recycled content of the glass or the country of origin in order to come up with more precise measurements. Is that right?

Charlotte: It's exactly that. And with these kind of tools, in a sufficiently detailed way to be decision useful and to negotiate with suppliers, to do everything with suppliers taking into account the carbon information in their day-to-day business.

Mike: This is part of the X that Hamid talked about earlier. So this is a platform that can become itself sort of a product that companies can subscribe to in order to have access to this refined data. Is that right?

Charlotte: It's exactly that. CO2 AI is a SaaS offering, We bring the data, we bring the platform, we bring everything, and the goal is really to equip those large corporations across the different teams that need in day-to-day to make decisions taking into account this carbon impact with the right tool and the right data, so no time spent crunching the data, searching for the data, et cetera. They have the data and they can really make good decisions that truly influence the carbon footprint of the company.

Mike: Right. So that's the connection between measurement and management and reduction. You can

then use that precision to make better decisions to reduce your footprint.

Charlotte: And you are touching something that is very important. It's not calculating a carbon footprint for the sake of calculating a carbon footprint, it's not accuracy for the sake of accuracy. The philosophy is really, "Let's be decision-useful and let's equip the people that are influencing the carbon footprint in their day-to-day jobs with the right tool so that they can influence it in the right direction."

Mike: And so, on the CO2 AI platform, is it also useful for scope 3 downstream, the use and ultimate disposition of the product?

Charlotte: Yes. CO2 AI covers the full scope, so scope 1, 2, 3, upstream, downstream. Scope 3 downstream, depending on the categories, we can get in some even harder calculations. So buying shampoo, you need to account for the water that you need to use the shampoo and the electricity that's needed, et cetera, so it's even more complex, I would say, than the scope 3 upstream from this perspective of data collection, et cetera. But it's worth, again, having tools that are able to crunch data, aggregate all sorts of data, not being stuck on one data format, is very useful because it's typically the field where you will use what you can find to start with.

Mike: Right. So this could help, for example, a car company who's selling electric vehicles get a better estimate of the carbon footprint, of the electricity used to power their vehicles if you have some microdata on where those vehicles actually live and get charged. Or if you're Procter & Gamble and you're developing a new soap for cleaning clothes, if you can make it work with cold water versus hot water

All right, so Hamid, let's turn to you because you're working on the adaptation and resilience side of the story. I wonder if you can take us through some use cases of how does AI help with climate adaptation and resilience?

Hamid: Climate change is already happening and we already feel the impact. They talk about floods, heatwaves, roads, and when it comes to preparing for this and for the impacts of those risks, the leaders of nations, cities, corporates, they are often stuck. So we believe there is a decision gridlock, and this decision gridlock is simply because decision makers don't always have the facts. They need to move to action. The reason for that is that climate change is prevalent, risks are everywhere, and then we have different nature of risks and the impact of those risks on economic activity, on

assets, on people, on value chain, are quite difficult to model.

The data is available, however it's very hard to integrate. We have conducted a study for more than 1,000 decision makers across several countries, and more than 80% of them believe AI solution, data, advanced analytics solutions are very useful in their fight against climate change. However, they all believe, and that's more than 75%, that they have a hard time accessing those solution, they have hard time finding the experts and simply put, a CEO will have a hard time explaining to his shareholders that he needs to invest a vast amount of money to adapt or to become more resilient if he doesn't have the facts that are necessary to mobilize those investments.

And what are those elements? The first element that can make a shareholder move or make a government move is the cost of inaction. "How much is it going to cost me to actually do nothing? What is going to happen and where?" And I need to be precise about those elements. And the second element is to be able to find where I'm going to apply the right levers. Where do I build a sea wall? How do I deploy drop-to-drop irrigation? Maybe I will need to invest in my infrastructure to make them more resilient to extreme events.

All those elements cost a lot of money. We need to prioritize them based on the return on investment for a CEO or based on the official economic return on investment for a government or a decision maker or in a city. We bring all the data and organize this in a way that helps decision makers get to the cost of inaction and identify the levers and prioritize and sequence an action plan to deploy it.

The challenge is that modeling the risk is quite hard, being able to identify the impact, mobilize a lot modeling, and also being then able to navigate on the levers and try to identify them also takes a lot of effort. the platform we have developed around the adaptation and resilience topic is here to accelerate decision-making and help decision makers move to action.

Doing so, we mobilize science from academia, we bring data from several providers, some of them are for free, others we pay for them, and we build several impact models on economic activity, like in agriculture for example, and on infrastructure, on population, on the impact on the value chains, all those elements we try to actually solve and support.

Mike: So that's a really interesting high-level overview of how you're integrating these various data sets in order to create some risk modeling in order to help inform

decision-making, because they have a better sense of the do-nothing scenario versus various investments. Can you take us through an example or two of how clients are using these services to make better decisions?

Hamid: Sure. Let me take an example of highway operators in Europe. They used to spend millions of euros every year to actually maintain the roads and tunnels and bridges. Unfortunately, they have not thought about what is going to happen in a few years when they will face extreme precipitation events, where temperature will rise to levels that they have never expected before, and where the changing temperature can be quite drastic.

So all those elements have a significant impact on the roads, the tunnels, and the bridges. And that's only the impact of climate change on the assets. Now you have disruption, of course, number of days of disruption per year for a portion of the road is basically loss of P&L. When you add all those elements and you show the cost of inaction to the CEO, basically he is surprised and starts to be afraid and starts to mobilize people to move.

And then he realizes that the cost to actually change things is enormous because heightening a bridge or adapting a tunnel to extreme precipitation costs a lot of money, far more than what he can invest. And he needs then to start to mobilize other stakeholders, the municipality public leader or the ministries and start to think about, "How are we going to face this together?" A few hours of disruption on a road is GDP loss.

We're talking about people losing their job. We are talking about businesses that cannot operate, other value chains that can be disrupted. So that's the real cost for the decision maker on the public sector side. For those leaders, the cost of inaction is even bigger. Then you start to think about how we can mobilize private sector and public sector to try to adapt and become more resilient together because that's the only way we actually will be facing climate change in the future.

Mike: It sounds like you're revealing a blind spot that this operator has in that they've been making investments, presumably, for decades in this infrastructure that you're describing, but it sounds like their investment strategy even today sort of assumes a stable climate, and that the investment decisions that they made a decade ago using that approach is sort of good enough for now.

The value that you're adding giving them real specifics on that in terms of saying, "These bridges will need different types of enhancements than you've thought of before, or these roads, when you're repaving it, needs

maybe a different formulation of asphalt because you have to anticipate hotter temperatures." Is that right?

Hamid: Absolutely. the fact that people do not know what's the cost of inaction, and that's why they're not moving. They don't know simply because it's actually for them hard today to estimate and to have a visibility on that cost. And the cost is not only again the impact on infrastructure, on assets, it's also the P&L impact. And beyond that, you are always part of an ecosystem, you are not alone.

So if the port infrastructure is actually disrupted, you are disrupted. If the electrical companies actually are disrupted, you cannot operate. So again, fighting against the impact of climate change and becoming more resilient cannot be an individual action only, but everyone has things to do. And the first thing to do is to be aware and to be clear about what is going to happen and change your decision-making process. I'll give you an example that is quite interesting.

Some real estate funds, for example, are now only starting to think about the investment they made a few years ago in locations that might be prone to flood or to extreme events. They now start to realize that they are exposed to stranded assets potentially. And there is a mobilization in the financial world around this because they start to really realize that the impact is quite massive.

And we have this TCFD framework that now is enforced in several countries, where now all the companies that are listed need to disclose their climate risk and exposure, simply because shareholders need to know. And they realize it's not that easy to actually come up with this cost of inaction. And then when they see the cost of inaction, they start to realize that they need to move fast.

Mike: And I think some folks might think, "Well, those risks are insurable, and so why does the asset owner need to worry about that?" What's your response to that?

Hamid: I would remind them that insurance is a business. So when we think about the magnitude of the risks and the impact of those risks, it will be reflected in the insurance policy.

Mike: So those rates are going to go up, and then ultimately, some will just not make any sense to insure, so they'll be uninsurable, is my sense.

Hamid: Or you will have a cost of insurance that will be very high and that will be part of your cost of inaction.

Missing: Promo for another podcast series (Carbon Copy) at around 21 minutes.

Mike: I know you've worked with some agriculture-based companies and for example a brewery. Can you tell us about that?

Hamid: Agricultural input will be and is already heavily impacted by climate change, not only in terms of temperature, in terms of humidity, in terms of precipitation, all those elements have major impact on yield.

When we start to work on the cost of inaction for a brewery, we start to see where are the farm, where they get their barley from, and what is going to happen to them in terms of climate change? What will be the impact on yield? What will be the potential disruption on the supply, especially with the farms where they have long-term contracts? What will be the impact on the price and the cost for them to actually go get this input?

Once we have these risks, based on what they do today to get their barley, we start to think about what they can do in the future, what kind of lever they can deploy. It can be helping the farmer. and trying to think about their agricultural practice, for example, thinking about cover crop and applying some specific fertilizer or some specific input that can help their production become more resilient. But they can also think about diversifying their supply and maybe try to start to contract with other locations where actually the production would be less affected in the future.

They need to move fast because the thing is when climate change will hit the barley production, everybody from their competitors will be in the same situation. So there will be a race to who is the one who actually moved first to secure their supply in barley.

And the relationship is quite important because, for agribusiness players, they need to build alliance with the farmer upstream, and think about how together they're going to fight climate change and that's the way the whole value chain can become more resilient.

Mike: Yeah, there's some interesting parallels between the work you're describing, Hamid, and the work that Charlotte's describing on the mitigation side, both seem to involve better data to get better measurement. In her case of, for example, upstream supply chain choices. In your case, forecasting sort of the do-nothing scenarios in order to make better decisions to become...either to reduce your carbon footprint in Charlotte's case, or to be more resilient in the cases you're describing. Does that sound right?

Hamid: You're absolutely right. And the parallel is that the complexity is coming from the fact that when we talk about adaptation and resilience and when we talk about mitigation, we are talking about value chain. You need to get visibility on what's happening upstream but also what's happening downstream to really build a sound adaptation and resilience plan.

Charlotte: If I may add, because I agree on the fact that there is a real parallel between mitigation and adaptation and there is another aspect which is also collaboration along the value chain. All this data, all those decision-useful details that we need to be able to collect, measure better, et cetera, they will be powerful only if there is also a very strong dynamic of collaboration that gets activated. Hamid was giving the example of the farmers collaborating with the brewery, and in the case of emissions reduction, it's the same. It will only happen if everybody on the value chain starts collaborating together on deliveries.

Mike: So Charlotte, talk us through what's a pitch you would make to a client if they say, "Well, why should we use your services?" What's the ROI that I should be thinking about?

Charlotte: Yes, there are three dimensions. The first one is still the reporting, the compliance that just needs to happen and in more and more geographies, the regulation is getting more stringent. So people will need to equip themselves with tools that are of good quality, that allow great availability of the data, et cetera, et cetera.

The second thing is an efficiency aspect because I can tell you that calculating a carbon footprint the way it was done over the past ten years, manually in an Excel spreadsheet, is a very long and painful task, especially for large corporations. It can take several months even if it's just a refresh and you have all the spreadsheets in place, et cetera.

And last but not least, it's really useful to move to action and to make the right trade-offs about what to do to reduce your carbon footprint and also optimizing it from a cost perspective. Having a tool that really helps you in a second identify the impact of a decision, but from a cost and CO2 perspective is really, really valuable.

And all the studies show that there is a lot that can be abated in terms of carbon footprint at no cost or positive economic impact. So it's super important to be able to identify those decisions and to put them in place first, so that's the three key things.

Mike: Hamid, how about for you? What's a pitch that you'd give to a client? How do you characterize their return on investment for engaging BCG and the work that you do?

Hamid: The way we convince clients of the importance of the topic is first the cost of inaction. We try to get a sense of what it could mean for them by identifying some hotspots. Let me give you an example, I was working for a fertilizer company and they rely on a port infrastructure. For them, climate change will have an impact on agriculture, et cetera, but they did not think that they would face sea level rise and the importance of sea level rise on this infrastructure. We have the models for that.

So I simply take two or three hotspots and usually, because they didn't get to that level of detail because it's difficult to do that, to downscale at an asset level, they realize that actually the cost of inaction can be quite important when you give them the full perspective of what it means not only in terms of the impact on assets but also in terms of the disruption on the value chain, on the production, then the impact on the P&L.

What happened in the summer in terms of drought and what's what happened also in terms of flood in Germany and in Belgium was quite a shock for several leaders because what we heard could happen in some part of the world, the impact of sea level rise on some small islands, I mean, that's quite remote. Now the temperature is rising and we start to feel it and we start to hear it everywhere.

Now, why BCG, and why mobilizing our modeling capabilities and our platform? Simply because we show them one thing: all those models, they actually exist. We are not inventing them, we are not trying to innovate on the scientific side of things.

What we do is only we use what exists, and that is quite reassuring for them to tell them that this is publicly available, the key challenge is we need to help you use them and also build your capability to be able to be autonomous in the future to inform your decision. And that part of the pitch is also, I believe, quite powerful, and it's their responsibility as decision-makers to use the best available data and the best available modeling, especially when they have access to them, to make the right decision and move to action.

Mike: So Hamid, you're based, as you mentioned, in Morocco, sort of an area that spans Africa and Europe. What are the opportunities you see in particular in Africa? Africa and other developing economies are particularly vulnerable to physical manifestations of climate change, and yet they may or may not have the resources to invest, to safeguard themselves against it. So how are you threading that needle?

Hamid: That's an excellent question. We as BCG started to deploy all those efforts around climate change in Africa and in Southeast Asia, in the developing world. Why so? First, because they are disproportionately impacted by climate change. And even though they have a limited responsibility in the emission side, unfortunately they are the one that are the most impacted. And as you said, they are not equipped to face climate change in terms of expertise, in terms of resources, and also, the reality is they are facing other challenges in parallel, that you might not find in Europe, in North America.

So we are working a lot with international organizations, with the UN, we are working with foundations to actually support those countries, those cities, those corporates in Africa to adapt. We have started with them simply because at the beginning, that was a social impact perspective. And then, of course, adaptation became also top of the agenda in the developed world, and now it's becoming very important as well and a large part of our focus as well.

Now, what are the key challenges that we see in Africa? First, a large portion of the GDP in Africa is dependent on agriculture. Several countries in Africa still are facing drought in a very frequent manner. And when I take Eastern Africa, for example, we were working with WFP on trying to anticipate drought and try to identify what can be done in terms of investment to help make the farmers that will actually face this extreme event adapt fast by investing in drop-to-drop irrigation, for example. Or simply by anticipating that some region would face massive shortage in terms of food, for example, and help WFP direct their support in those specific locations.

So we have those kind of intervention, but we are also helping governments and states like the Lagos State for example, in designing the adaptation and resilience plan. They will face sea level rise as a major risk that will have severe impact in terms of infrastructure, in terms of economic activity and in terms of impacting the population, but also impacting the agriculture.

So the impact of sea level rise on Lagos is quite massive. What we have done is we have built the adaptation and resilience plan, we have identified the cost of inaction, and we have taken that to the last COP and tried to actually mobilize investors, international organizations to support Lagos State in developing their adaptation and resilience levels. The top ten projects that will have the best socioeconomic return on investment.

Mike: Interesting. Now, I don't think people have an appreciation for how many people live in Lagos State. Do you have a sense?

Hamid: 20 million people.

Mike: Yeah. That's a huge concentration of population in Africa.

Hamid: It's a mega city in Africa, the name Lagos means Laguna in English, so you can imagine that we have a city and a part of the state that is particularly exposed to sea level rise, and there are ongoing projects now, infrastructure projects that are exposed. If you don't have the information around the risks and the impact of those risks, a public decision maker cannot make decisions to invest in adaptation and resilience. And by the way, when we have estimated what would be the investment required, it's far more than the budget of the Lagos State. It cannot afford it, simply.

Mike: Yeah, it's another case of building for a static world when it turns out the world is quite dynamic. It's interesting. It's a lot like your infrastructure example in Europe in some senses. So Charlotte, what's new, what's coming down the pike in your world? How do you expect your business to evolve in the coming years and decade?

Charlotte: I think we need to try to really bring the rigor that we have in financial accounting into carbon accounting. And for that, tools, digital, artificial intelligence will help a lot and will help not only do the measurement but move to action. We did a survey this year and it appears that companies that are equipped with these kind of tools, they are two times more successful in implementing their abatement levers and reducing their emissions.

Sustainability overall is not that digitalized today, I really hope that we will find more and more use cases at scale of tech, digital, artificial intelligence to help measure better but also help reduce emissions. And there is a ton of things to do on that topic to optimize operations in every part of the value chains, in fact, and use all these techniques that have proven to be so impactful on carbon instead of margin or financial-only KPIs, as we used to do it in the previous years.

Mike: Great. So a lot of our listeners are considering careers in business that focus somehow on climate change, and I wonder if each of you can articulate where you think the biggest opportunities are, what resources our listeners might consult. Basically, what advice do you have for them, those who are thinking about getting into

this space, writ large? So Charlotte, can we start with you?

Charlotte: Yes, sure. I would say that first there are plenty of opportunities. It's a field that is being defined at the moment, that is accelerating very fast. For me, the best advice is just get started, start somewhere in a project that you feel is interesting and matches your skills and what you want to do approximately in the longer term.

And even with data for good projects or things like that, if people are interested in the field of climate tech, et cetera, there are tons of opportunities. LinkedIn is a very good channel to identify those opportunities. There are tons of groups now that are being developed, or people that are publishing a lot of news and offerings that can be interesting. So that's a bit basic, but that works well in my point of view.

And then in terms of resources, I also feel there is a lot of open-source things that are very, very good content and that can also inspire, nourish people, and help them define what they want to do or build their expertise. I like to read a lot what can be found on the World Economic Forum website, for example, on the CDP website, they do very good reports several times a year that are really worth reading. On bcg.com, there is a lot of good content too. And LinkedIn is also, again, a very good source of inspiration, I think.

Mike: Great. And we'll provide links to that in the show notes to those resources. Hamid, how about you? What advice do you have for those looking to get into this space?

Hamid: I would have general advice to everyone, including the one who do not necessarily wants to actually make a career in this space. Climate is becoming a central topic for all decision maker, in the private sector, in the public sector, it's a major concern. So even if you don't want to make a career around the climate challenge, as you need few years back to know what digital means and how it's going to impact a corporate, you absolutely need now to actually have a clear view on what is our impact on climate and how climate will impact us on the mitigation side and an adaptation and resilience side.

For me, I encourage everyone first to get knowledgeable around this topic. Now, for the one who actually wants to go further and make a career out of this and have an impact on adaptation and resilience or on mitigation, first get informed. And as Charlotte says, the resources are everywhere. The last COP, for example, you will find a lot of resources around adaptation and resilience,

which was a topic that was not voiced that much before, that last COP was the COP of adaptation. You will find reports from the high-level champions, each year for each COP they publish fantastic report. And those are not the 200 or 500 pages report, and it can be quite easy to read and quite informative.

And then, I encourage people to participate to virtual forums around the topic, where you can interact with other stakeholders, thought leaders, and actually get informed. And then I would encourage them also to take specific module in Harvard Business School on climate change, on adaptation and resilience on top of mitigation, not mitigation only because the two topics for me are absolutely complementary and we need to have a view on both, so those would be my advice.

I'll give an example. Myself, as a managing director and partner at BCG I spent a few weeks at Cambridge, and thanks to BCG, getting a special curriculum around climate to get deeper on various topics. And for example, you can think about building materials. There is a whole field on that. So really take the time, if you are in a business school, take classes around climate, whatever the topic. And then of course, you have a lot of resources everywhere and you can get involved in various webinars and in various forums.

I will add one element. Several leaders are telling me that climate change is hard to model. Impact of climate change is difficult to estimate on a local basis in a value chain.

In reality, every day everyone is using advanced analytics and complex modeling to make day-to-day decisions. Everyone is using the weather to decide if they're going to bike or not, to decide how they're going to dress, but also for corporates to decide what's the best route depending on seaworthiness. All this data is available, all the models are actually available as well, and we use the weather every day. The reality is we need to make climate change modeling available to everyone to be able to plan properly as we made the weather available to everyone, be it individuals, corporates and governments to be able to make the right decision in the future.

And let me give you one example. If individuals like me and you had access to what is going to happen in a specific location in terms of climate change, they might actually change the way…a key decision of buying their house in that location, that's very important. It's a call for transparency and availability and accessibility of climate change models, climate change data to everyone.

Mike: Great. Thank you. That was terrific. Hamid, Charlotte, thank you so much for joining us on Climate Rising. It's been a really interesting conversation to learn how you're applying AI and data analytics to both the mitigation story and to adaptation, and helping companies on their climate journeys. Really appreciate you spending the time with us.

Missing: Mike's closing acknowledgements, etc.