

ESG Now Podcast

“A/Cs and Adapting to Climate Change”

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Bentley Kaplan

Hello, and welcome to the weekly edition of ESG Now, the show that explores how the environment, our society, and corporate governance affects and are affected by our economy. I'm Bentley Kaplan, your host for this episode. And on today's show, it is getting hot. So we're going to crank up the AC, or air conditioner if you prefer, because as a global population contends with higher average temperatures and more frequent and longer heatwaves, that's exactly what's happening all over the world. And while office debates rage over what the temperature on the thermostat should be set to, investors will be thinking bigger picture, longer term.

Because increasingly, our changing climate is calling for the twin approaches of climate and mitigation and adaptation. And while investors may be inundated with ideas, frameworks, and disclosure regulations on climate mitigation, adaptation may be a newer field. So today, we're going to start with the humble air conditioner, an off-the-shelf adaptation solution to extreme heat risks. We'll ask how suited it is to its task, why things may not be as simple as they appear, and where we think this technology is going to be needed most. Thanks for sticking around. Let's do this.

You've probably been there before, that wonderful feeling as you step off the pavement of a sweltering, muggy afternoon, into the crisp, clean, air-conditioned bliss of a building. Much better, right? And if you're thinking that feeling is happening slightly more often than you remember, well, you'd be right. Because in July, we as a planet were on a 14-month literal hot streak, the longest in 175 years as recorded by the National Oceanic and Atmospheric Administration. It may be unusual, but climate change is making these types of record-breaking events more common. And with good reason, a lot of the discussions we've had on the show have focused on mitigating that climate change, slowing emissions, and ultimately lessening the severity of climate impacts.

But the reality is that there is a component of climate change that will be unavoidable, and we're going to need to find ways to adapt to that change. And it's this adaptation that we're talking about today, which is where good old-fashioned AC comes in. And for investors looking for an adaptation investment case, it may seem like a pretty obvious option. In many places, many people will need air conditioners more of the time.

And someone who knows a lot more about this than me is Matthew Lee out of MSCI's New York office. Matthew not only covers electrical equipment, but has done quite a bit of research into risks from extreme heat. So first up, Matthew talked me through conventional air conditioners, and to be honest, burst my bubble a little.

Mathew Lee

Yeah, I would say conventional air conditioning, they sit in a very unique part of the spectrum of climate mitigation versus adaptation. On the one hand, we're definitely going to need more cooling in general to keep people comfortable, to keep people safe. But if we don't improve the current cooling

technology we have, we're not only going to face setbacks on our emissions targets globally, but also a lot of the refrigerants used in air conditioning units contain hydrofluorocarbons. And so these substances, they absorb heat from indoor air and then they can release it outside and therefore cool the environment within the building. But these HFCs, they can pose significant environmental hazards. They're a very potent greenhouse gas. And so even though they might not be emitted to the atmosphere as much as carbon dioxide in terms of tons, every ton of HFC is so much more potent in its greenhouse gas effect. And that's why we do have things like the Kigali Amendment to the Montreal Protocol, so global environmental efforts that are trying to phase out the use of HFCs.

The bigger issue, of course, beyond just the cooling is the energy burden. If we are to build out as many units with their current efficiency, we will be adding a lot of stress to grids in places like cities that already may be stressed out in terms of their grid delivery capabilities. There might just be a cap on how much cooling can be added before there are blackouts and issues. But at the end of the day, this is a bandage solution, right? This is at the very end of not only reducing emissions, but also reducing heat within our buildings, reducing the cooling needs and energy demand in our buildings, turning on the AC at the very end of this chain of actions we can plan to take.

Bentley Kaplan

Okay. So old school ACs, those ones that look like box-shaped televisions that are wedged into walls, half in, half out of a building with that signature hum, not so great as it turns out. They do help to lower a building's internal temperature. And in many cases and some places, that's not only comforting, it's necessary for survival. So that is a plus. And to be fair, it's air conditioning's main reason for being. But there are side effects, as Matthew explained. There's an ironic feedback loop where traditional ACs release hydrofluorocarbons or HFCs, and these are like supercharged greenhouse gases, which ultimately exacerbate global warming. And this isn't necessarily news. It's an issue that many have tried to solve in the past.

And one of my favorite examples is technology that was covered in a Nature Communications paper back in 2019 in an article called "Crowd Oil, Not Crude Oil." And this technology consisted of retrofitting conventional air conditioners so that they would act as mini carbon dioxide capturers, if that's even a word. And not only would they capture carbon dioxide, but that they would also produce a hydrocarbon fuel that could be used in hard to abate transport like shipping or long-distance trucking. And this technology would solve the problem of conventional air conditioning being a win for adaptation but a loss for climate mitigation. So I asked Matthew what kind of newfangled and wacky technologies could be scalable to meet this challenge of extreme heat without necessarily making things much worse?

Mathew Lee

Yeah, Bentley, I think it's great you raised some of these exciting tech solutions, but they still run into the typical problem that what's cutting edge in terms of sustainability is not always feasible in terms of affordability. And when we're thinking of so many residential units, there might be a bit of a mismatch there in terms of how commercially ready is that type of technology today or in the next five years. But there are a couple of different approaches to tackle this cooling problem, starting directly, if we want to stay in the AC world, with better refrigerants, right? So refrigerants that have less of this HFC concern, there are propane, ammonia, carbon dioxide, different types of refrigerants that are being used as alternatives. However, they have their own sets of issues. So hydrocarbons like propane, they can be flammable. People might be resistant to having that in their house. Similar to

ammonia, also has corrosive toxic properties. So maybe these are more fit for, say, industrial sites that have better safety and hazard disposal.

We do have heat pumps that I think are becoming a lot more popular in the residential use case. So this is a system that essentially exchanges the heat from outdoor to indoor. So it can actually not only provide cooling, but also heating depending on the season. And these refrigerants in here can be based out of carbon dioxide, so they might not have as many safety concerns, but the constraints there tend to be cost. They tend to still come at a premium. And without enabling policies and regulations by local governments, they tend to be hard to adopt at a large scale.

Finally, passive cooling is actually a very big front of the end solution to tackling all this, and that's how you design your buildings or through modifications and retrofits to eliminate the need for having an AC unit or turning on an AC unit for as long as you need to. So these are measures such as preventing or blocking heat from even getting in. So blocking solar radiation, putting better shading, dissipating the heat, modulating the heat, so ventilation, insulation, high performance windows, as well as energy-efficient measures within buildings. These are all bigger infrastructure changes that can come in, but really offset the individual household cooling needs.

Bentley Kaplan

Okay, so there is good news here. HFC-free air conditioners, heat pumps, and passive cooling, alternatives to old school AC but with fewer side effects. And sure, there will be pricing considerations and of course practicality in application, but the clock is very much ticking. For all of its drawbacks, noisy, messy, old school AC solves a real problem, and it's a problem that's happening in more places and to more industries. And if there's something else to know from this episode, aside from the best and edgiest and cooling solutions, it's that risks from extreme heat are going to do more than just make things more uncomfortable and slower for workers, whether that's in an office, a factory, or a farm.

And very handily, colleagues that are both smarter and more charismatic than me have written some great research into just how heat-related risks will affect which industries, where that will happen, and exactly how these risks could play out. If you're looking for an easy jumping off point, check out a recent blog that Matthew co-authored with Katie Towey called "It's Getting Hot in Here: Assessing the Risks of Extreme Heat in the US." It's on msci.com and free for everyone to read. And as someone who has been looking at this issue of extreme heat, Matthew had a few more insights to share, not only on where these risks are going to rise, but also what parts of the market may be moving first to solve them.

Mathew Lee

For investors. I think this is a bit of a triaging exercise of which technology, what customer segment, and where in terms. Of where, we know that most of the growth is going to be in emerging markets. So right now, about 46% estimated by the UN of global cooling capacity is in emerging markets. But by 2050, it's actually going to be two-thirds, 67%. And even though China will be the largest market in absolute terms of the emerging markets, the growth is only 18% from now to 2050. The largest growth will be in areas like South Asia. That's going to increase 4.5 times of current. Cooling capacity in Africa, that's estimated to 7X its current cooling capacity by 2050.

In terms of by segment, there's very different needs. So as we mentioned, for commercial and residential buildings, there are some of those heat pump or passive cooling solutions that do require a bit more capital upfront to scale. And then for industrial use cases, though, I do think there's a direct tie in with certain sectors like the food industry or agriculture or pharmaceuticals where the cool chain or refrigeration of your products as they move along the supply chain is a very material part of their operations. And so in those industrial use cases, I think there's maybe a more immediate incentive for certain investors to benefit from advances in those technologies.

On the solution side, what some people are discussing as potential ways to tackle this are aligning with interests that are in these sectors again. So whether it's that building or commercial retrofit investor or infrastructure investor that's improving buildings or doing new buildings, this can be probably something that's earmarked in directly as an improvement, as a line item for green finance or labeled finance, given it has not only these environmental but also social benefits.

The other angle would be the AC industry is quite consolidated. There's only a couple of top players. And so to replicate what Bezos Earth Fund and maybe RMI have been doing, which is building these off-take agreements for new technologies as they emerge, securing them, a buyer's alliance type of approach, and that type of off-take agreement has been very successful in deploying other types of mitigation technologies in hard to update sectors.

And finally, I'll mention for private investors, it's been very interesting to see activity here in the US where actually HVAC companies are one of the most active acquisitions in the SME space now by private equity. So a lot of the implementation of cooling is by small medium enterprises at the end of the day, and so investors that are active in this space already may see opportunities here as the broader market and demand for cooling continues to grow.

Bentley Kaplan

And that is it for the week. A massive thanks to Matthew for his take on the news with the sustainability twist. And I also do want to say thank you very much for tuning in. If you like what we are doing, then let us know. Drop us a review, rate the show on your platform of choice, and tell a friend or colleague about this episode. Thanks again, and until next time. Take care of yourself and those around you.

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