Rising Temperatures, Rising Prices: How Climate Drives Inflation

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Greg Dalton: I'm Greg Dalton.

Ariana Brocious: And I'm Ariana Brocious.

Greg Dalton: And this is Climate One. We've heard a LOT in the last few years about inflation – how much of it we're seeing, who's to blame, when it might be tamed enough for interest rates to start falling again. But missing from a lot of those conversations is the role of climate disruption.

Ariana Brocious: We know there are connections between extreme weather, destroyed inventory and higher prices…. But still, it can be hard to get our arms around how this really plays out for companies and consumers.

Greg Dalton: Yeah. One place it does tend to pop up is in the prices of so-called luxury foods, like wine, chocolate and coffee. And on our staff, no one knows coffee better than producer Austin Colón. Hey, Austin.

Austin Colón: Hey guys.

Greg Dalton: So was that an insult, do you consider coffee a luxury?

Austin Colón: Maybe… It's a luxury that I need in my life! Without coffee, I'm an EV without a battery, I don't go anywhere.

Greg Dalton: (laugh) Fair enough! So what have you noticed about the cost of coffee recently?

Austin Colón: So, I live in Brooklyn and coffee is not optional for me. I drink it every day – and I buy

my beans from a local coffee roaster. I've been a regular for about 3 years now and I've definitely seen the price for my 12 oz bag of beans go up, by about $3. So I had a chat with the head roaster and anticipated he would tell me how climate forces are making the coffee trade more expensive. But that's not actually what he said.

Greg Dalton: What did he point to?

Austin Colón: He actually pointed to the transportation of the beans from the farms they work with to here in Brooklyn. And our chat really hit home that this is just another example of how hard it can be to pinpoint climate inflation, even for those who work in an affected industry. And even as we're feeling it in our finances.

Greg Dalton: Right. Global systems are complicated AND YET we know climate is driving inflation in many sectors.

Ariana Brocious: Remember how bad things were during the pandemic? When grocery store shelves were empty and the price of flour was super high and it took forever to get things delivered? That's the kind of stuff we're talking about, though maybe not as dramatic, and maybe not all at once.

Greg Dalton: We'll dig into that more later in today's episode. First, we want to explore a few more of the direct ways climate inflation might be impacting your bank account. Costs of burning fossil fuels that are hidden in the economy. One major area is buying and insuring a home.

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Ariana Brocious: First Street Foundation uses climate science to model climate risk everywhere in the U.S. But as we've talked about many times on this show, climate science has a communication problem.

Jeremy Porter: Climate science lives in the academic journals. People don't have access to it. The people that know it, you know, oftentimes publish the work at a level that most of us can't understand if we're not climate scientists.

Ariana Brocious: That's Jeremy Porter, head of climate implications research at First Street Foundation. He says his organization is really focused on **quantifying** and **communicating** climate risk. They did a bunch of surveys and focus groups that revealed two things:

Jeremy Porter: People thought that climate science was something that wasn't going to affect them. And it was something that was going to happen in 2100, which, if you start to think about it, there's a good reason why people just aren't paying attention. And so what we started to do is really focus on the symptoms of climate change. Is there more water in the street that we're able to measure? Are wildfires happening more often? Can we measure that in observation? Are we seeing stronger tropical cyclones? And so we really started to focus on these actual observable metrics. And then we tied him to the individual themselves by creating the tool that we created called riskfactor.com where we, where people can go in, they can type in their address and they can understand, you know, that this isn't something that's going to happen in 2100 is something that's been happening for decades. Now we're tracking it over time and we can produce some type of empirical outcome, whether it be property damages or additional depth of water at the tide station that you can look at and you can sort of see it tracking over time and you can see how it's going to impact your property specifically.

Ariana Brocious: Yeah, so as a homeowner, give me a sense of how I might use your data to

understand my own climate risk evaluation.

Jeremy Porter: Yeah, so there's a lot of different ways you can use it. At this point, we have flood data, wildfire data, tropical cyclone wind data, which includes hurricanes, air quality and heat data. And all of those metrics are things that affect different parts of the country differently. So if you're in the southeast, you may be particularly worried about hurricanes and flooding. If you're in the west, you may be particularly worried about wildfire. But one of the big problems that we have, around all of these different perils is that there is no public source to go look at and understand how these perils impact you directly. For flood we have the FEMA maps. Even those don't include heavy rainfall. They don't include small waterway flooding. They really weren't designed for property level risk assessments. They become that over time in the absence of anything there. So what we really wanted to do is build this tool where people could go on. They could understand the risk to their properties and they could they could get that information in one place and in sort of an easy to understand way. So we're showing people historically what the trends look like, what the current environment impacts look like and what it could look like into the future to sort of give people a holistic view.

Ariana Brocious: I am honestly a little daunted hearing you describe that because I'm sure that any property has some amount of risk. Obviously, it's inherent with just existing, but we're probably unaware of some of the risks we already face. Some insurance companies have stopped providing coverage in certain markets altogether based on climate risks. That leaves people at real financial risk if you can't insure your home. As you see it, what's happening in the insurance industry right now?

Jeremy Porter: Yeah, you're right. And as you start to work in this space, you always wonder, how is climate going to price itself into the real estate market? I mean, the real estate market, our own properties, the homes that people buy are generally their most valuable assets. And when you think about the ways in which people think about their homes. They're really buying this home with a 30 year contract attached to how much they're going to pay in mortgage, principle, taxes, insurance, but they have some expectation around the cost of home ownership. The recent pricing of climate into the real estate market has really turned a lot of that upside down. People are, are all of a sudden being charged more than they thought they would be charged when they first took out their mortgage, which is changing the dynamics of the calculus around cost of home ownership, but the insurance companies really just responding to risk and they're responding to risk in a way that they haven't in the past. Some of that's due to the fact that some areas that we built into in the past were safe or at least perceived to be safe when we first built those areas. Now we're starting to see risk in those areas. Some of that has to do with just larger economic conditions. We saw inflation increase. We've seen damages in cost to construction from these climate events increase. And when you start to couple all that together, really it's coming from a couple of different sources. like the reinsurance market is already starting to take into account climate and starting to pass those costs on to primary insurance companies who then are passing it on to homeowners. And, you know, ultimately from our perspective as we started to do this analysis around insurance, we've really focused on the fact that we've built this climate debt up for, you know, the past couple of decades, we really haven't done much in the way of addressing it in terms of pricing it into the real estate market. The insurance companies and the insurance industry are the first.

Ariana Brocious: You're speaking about people who are assuming this is a 30 year financial commitment in most cases. Are we seeing lenders, like banks, begin to factor climate risk into their lending? I mean, are they saying, hey, these places we're not going to back you, because we're not sure you can live there in 30 years.

Jeremy Porter: It is starting to work its way through the entire financial system. The SEC recently

put out guidance and regulations that they're still refining and working on. But essentially they are trying to figure out how we understand the economic risk to climate hazards across the country. So it even at the level of the SEC. But then you're starting to see it at a lot of the different banks. They're starting to ingest climate data to understand risk analytics and think about that as a factor before actually going through the process of moving to the mortgage stage. But they're also just trying to understand the climate risk for their own holdings, given the amount of properties that they already hold and the risk attached to that. And that goes all the way up to some of the biggest, mortgage holders, places like Fannie and Freddie and other organizations. They're all interested at this point in, you know, how much risk do their holdings have and how can we start to understand that? And if we can adapt and mitigate that risk.

Ariana Brocious: So you mentioned that an individual can go on to the risk factor website and sort of figure out their own specifics for their own property. I'm curious if prospective homebuyers are using that resource. Have you encountered people who maybe have used your tools and changed their mind about whether they want to live in a given place?

Jeremy Porter: Yeah, we are starting to see evidence that people are using the climate data to make decisions around home buying. And in particular, some of our data is on the real estate portals at red fin dot com at realtor dot com. And one of the most interesting projects that's come out so far is this control treatment designed test where half the people that came on to the site were exposed to our climate data. The other half weren't exposed to it. And in that analysis, it was between some researchers from USC and Redfin. They found that the people that were exposed to the information systematically started to search for lower risk homes relative to those that weren't exposed to that climate, information and ultimately those people that weren't exposed to it didn't change their behaviors in terms of their searches.

Ariana Brocious: Climate gentrification is somewhat of a new phenomenon we've begun to talk about. And in some places like South Florida, we're beginning to see more of this. How do you define that, or what examples could you offer of climate gentrification?

Jeremy Porter: Yeah, the first papers that really came out on it were primarily centered in Miami Dade. We put out a paper that showed that homes were appreciating at a much slower rate if they had significant title flood risk than places that didn't have it. There's another paper that came out by a professor named Jesse Keenan that showed that people were actually surging actively for higher elevation in the housing market. people were going on and talking to their, to the realtor and they were saying, I want two bedrooms, three bathrooms or, you know, whatever. And I want a certain level of elevation of the home.

Ariana Brocious: I want to be on higher ground.

Jeremy Porter: Yeah, I want to be on higher ground. It became an amenity people were actually looking for areas that would flood less often. And they were moving into neighborhoods that had been generally less desirable before that. So the term gentrification got attached to it also because they were sort of displacing the population that was already in the area as they moved away from the risk and the more desirable areas.

Ariana Brocious: Right. So just to put this sort of a picture, it's like people who want to live on the coast, right, or near the water, because that's desirable, thus becomes more expensive. And then the people who are farther away from that amenity are the more lower income areas. And now we're seeing that reverse because you want to get away from the sea level rise.

What are some of the more unexpected ways climate risk is raising prices for an average person?

Jeremy Porter: The more unexpected ways probably are a lot of the unknown risks that exist across the country and the increases that we've seen more recently in regard to things like insurance premiums from the National Flood Insurance Program. It's in place to provide insurance to people that are in high risk flood zones to protect themselves from that flood risk, but it was subsidized since its inception until about two or three years ago, and because of that subsidy, people paid really low premiums for the risk that they've had, and the FEMA zones don't cover things like precipitation flooding, which we're seeing increase in like the Midwest. And if you have these heavy rainfall flood events, a lot of people aren't in flood zones. They never knew they had flood risk when they bought their home. There was never any disclosure that you're in a flood zone and you have to have some kind of flood insurance. So now all of a sudden, they're exposed to this repeated and frequent flooding, whether it be basement flooding or, or something more serious. That they never really knew that they had prior to that. So we are starting to see some of that make its way into the cost of home ownership. People having to pay for their own repairs.

Ariana Brocious: It's almost like you have to have a fund of your own. A catastrophe fund.

Jeremy Porter: Yeah.

Ariana Brocious: I was listening recently to a discussion about why more people are moving to Phoenix, which is close to where I am, in spite of there being increased, uh, every, every year is hotter than the last, water shortages, growing climate risk that's pretty evident, pretty daily and experiential. But it's a big economic magnet, and one thing that's been true here for a very long time is that water is very cheap. And I'm wondering if from a more business industry standpoint, if there were pricing that were You know, taking into account some of the factors and potential shortages around water, if you think that would be significant enough to shift, you know, a given company's evaluation of where they might want to relocate.

Jeremy Porter: Yes, it would. If there was some kind of a significant adjustment to cost and you start to think about revenue versus expenditures from even an asset valuation perspective, people start to respond to that, especially people that hold lots of assets or have a significant amount of that, say, a corporation that owns a building. The biggest issue right now is that, you know, over the next 30 to 50 years, we're not going to see major metropolises pop up in the Great Lakes area, you know, or northern Minnesota, where everybody can flock to as a climate haven. We have all of this economic activity that's already built into Phoenix, built into Houston, into Miami and you can't just abandon it. There's going to be significant amounts of effort that's going to be used to adapt to the growing risk before we start to see any type of abandonment or even significant trends in terms of people moving away. So it really is, driven right now by the decisions we've made in the past on where to invest and where to grow that type of economic activity.

Ariana Brocious: Jeremy Porter is Head of Climate Implications Research at First Street Foundation. Jeremy, thank you so much for joining us on Climate One.

Jeremy Porter: Thanks for having me on.

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Ariana Brocious: So the insurance industry is leading the way in terms of beginning to account for growing climate risk – either by leaving certain markets altogether or increasing their rates and passing those costs on to consumers. That’s especially true in places that see more flooding, wildfires and hurricanes – and where the sea level is rising. But those higher insurance rates don’t only apply to homeowners. Avery Ellfeldt is a reporter with Politico's Energy and Environment News who's been covering insurance and climate risk. She says these changes can also impact renters.

Avery Ellfeldt: The concern right is that if a property owner who's a landlord sees their property insurance go up, you know, 100 percent or 200%, they're going to need to cover that cost in some way and that could result in it being passed on to their renters, making rent more expensive. It also kind of really is an impact that could touch a much larger and more diverse swath of people because obviously so many Americans rent and don't own homes. So this is kind of one way that this one manifestation of kind of climate risk could really trickle down and affect much of the country.

Ariana Brocious: And it's not just insurance on homes that's going up. Insurance on cars is also getting pricier.

Avery Ellfeldt: Cars like homes sustain damage during a wildfire or flood. So insurers are kind of making some of the same adjustments, raising premiums for insurance or kind of limiting who they're offering policies to just to be sure that, you know, in the case of a big hurricane in Florida, for instance, they're not all of a sudden on the hook for, millions of dollars in, auto claims, for instance.

Ariana Brocious: A changing climate also has real impacts to our health – and so, health insurance could start going up too.

Avery Ellfeldt: There's growing science and research that shows things like extreme heat and wildfire, other issues that can have major health consequences for different populations or for all populations. And I think there's growing concern or attention to the possibility that something similar could play out for health insurers, wherein a disaster happens, you know, it sends a few dozen or a few hundred, depending on the area, people to the hospital with either, you know, complications from smoke exposure or heat exposure, heat stroke could have implications for diabetes, a whole range of things and that that could result in higher numbers of insurance claims.

So the concern is kind of, you know, If and as natural disasters become more frequent and common, so will their health impacts and that could really ripple into not only health systems, but the insurance companies who help subsidize health care.

Ariana Brocious: So to recap a little, basically, as we continue to live in places that are growing more and more risky from climate threats, we're gonna be paying more to protect ourselves and the things we have and our health, essentially just to continue existing in these places with, with the hope that we have, yeah, insurance to back up the losses that we'll sustain, right?

Avery Ellfeldt: Yeah, exactly. And I think it's a really interesting question as we think about affordability, right? We want people to be able to afford health insurance, home insurance, car insurance. It's super important and critical for recovery. But you know, at the same time, the market is trying to signal, Hey, this part of California, or this part of Florida is like no longer safe and low cost to live in.

Ariana Brocious: And of course, all these rising costs can really take a toll. Ellfeldt has investigated how extreme heat can be linked to higher reliance on payday loans – those are short term loans often with really high interest rates. Research done by Canada's Central Bank found that during hotter months, more people took out payday loans or defaulted on those loans.

Avery Ellfeldt: Basically the connection is that, you know, during a hotter month of the summer, for instance, three things happen. So one, people are going to use more electricity to cool their homes, so that's going to send their bills up. Another thing that can happen is people will have higher medical bills because they're going to the hospital, they're seeing health complications related to heat, you know, another added expense. The third thing is that people can actually lose out on wages

or income if they decide they can't go to work because it's if they work in construction or agriculture or something like that. So you're kind of seeing, you know, bills are going up as income is potentially coming down, which can put households, particularly that are already operating with less income, in a really precarious financial situation that can push families to go try to take out a payday loan to kind of bridge the gap, you know, before their next paycheck.

Ariana Brocious: And relying on payday loans makes people increasingly vulnerable to financial instability. Add those costs to dealing with increasing extreme weather and the disasters they cause… and you have a recipe for what researchers call "a disastrous debt cycle."

Avery Ellfeldt: If you're struggling to pay your car payment or your home payment or make your rent, already but then add on kind of higher utility bills, potentially medical bills, lost wages, it could mean you are defaulting on payments and that could actually impact your credit score or send you into kind of this long term debt cycle that would be really hard to get out from under.

Ariana Brocious: That was Avery Ellfeldt – we have a link to her reporting in the show notes for this episode – you can find that at climate one dot org.

Greg Dalton: You're listening to a Climate One conversation about how burning fossil fuels is making life more expensive. Coming up, how something as simple as a pothole demonstrates how extreme weather can drive up costs:

Nick Stern: So you're going to see it in the maintenance of your own car, and you're going to see it in the insurance premiums that you face and you're going to see it in the building and costs associated with the highways. That's going to come through in your taxes.

Greg Dalton: That's up next, when Climate One continues.

Ariana Brocious Please help us get people talking more about climate by sharing this episode with a friend. And we'd love to know what you think of the show. Please give us a rating or review. You can do it right now on your device – and it really helps people find the show. Thanks!

Greg Dalton: This is Climate One. I'm Greg Dalton.

Ariana Brocious: And I'm Ariana Brocious. We've just heard about how climate disruption is making all kinds of insurance – from home to auto to health insurance – more expensive. But of course that's only a small part of the bigger picture when it comes to climate inflation.

Greg Dalton: Right. Climate inflation hits us in so many ways. Nick Stern is a professor at the London School of Economics and former chief economist of the world bank. When we talked recently, he walked me through several ways extreme weather - driven by burning fossil fuels - is already affecting the costs of everyday life.

Greg Dalton: Nick, I don't know, you know, you're British in the UK, what do you have for breakfast and how is the prices of your breakfast being affected by climate inflation?

Nick Stern: Well, I normally have tea and porridge. But the tea is very vulnerable to changes in rainfall, changes in temperature. And, you know, we're going to see the price of tea be more unstable as time goes by. If you ask me about the evening time, the places in which our wine is produced are changing. So the Southern part of the UK is actually gaining, but big parts of the French wine country, whether it's Bordeaux or Burgundy or Champagne, you know, are in

increasing trouble because they're so dependent on climate patterns. Small variations give you big changes in outcomes. So, whether it's tea in the morning or wine in the evening, you're going to see these really quite sensitive things.

Greg Dalton: Right. One headline this week is cacao prices are soaring. That's one thing that maybe it's seen as a luxury, wine and tea might be seen as a luxury.

Nick Stern: Now, I mean, if you want to go back to sort of more basic things on the food front, you know, I'm in India a lot. And the last time I was there, because of climate change, the prices of onions, which are absolutely basic to all the forms of cooking really, or nearly all the forms of cooking. The price of onion has soared and that really kicked up inflation in India. So it's not just the wine and the tea. It's right across the board in agriculture.

Greg Dalton: S o energy and food are not part of core inflation because they're volatile. And yet if energy and food are not part of core inflation, what does that mean for measuring climate inflation?

Nick Stern: Well, it's a very strange thing that energy and food are not part of inflation.

Greg Dalton: The things we need most, right?

Nick Stern: I know. It's because they're volatile and you're trying to find things which are not particularly volatile. But it seems to me that the volatility is an important part of understanding inflation. So that seems to me to be not a convention that makes a whole amount of sense. But nevermind. If you're looking elsewhere in the index, and I think transportation is an important example where the costs of transportation have gone up, the costs of driving your car have gone up and that's reflected in insurance premium. It's reflected in your ability to go places. So I do think that disruption is reflected in prices.

Greg Dalton: Right. So one point about sort of how we measure this, you know, the potholes how does that get measured when it gets, that rolls up into taxes or it gets, you know, public costs of all these things?

Nick Stern: Greg, in the UK, the potholes come in a number of ways. The first is your tires and your wheels are going to last less long. Yeah. On average, they're going to be more expensive. These potholes are causing major road accidents and you're seeing very big increases in the insurance premiums. So you're going to see it in the maintenance of your own car, and you're going to see it in the insurance premiums that you face and because extreme weather events are undermining the roads more quickly. You're going to see it in the building and costs associated with the highways and that's going to come through your taxes.

Greg Dalton: Right. So there's direct and indirect costs that I'm going to some I'm going to see more clearly more others that I won't see. Taking a look at cars, switching to electric vehicles, lowers emissions, improves air quality, has many other advantages. And yet, how does that factor into this? Cause EVs are still a little more expensive to purchase though they're cheaper to operate.

Nick Stern: Yeah, you've got to look at the cost of running these things. And as the patterns of our consumption change, so the price indices we use are going to, have to change. Now at some point before long, you know, just as the gas price is in the inflation rate, you're going to have to have the cost of recharging come into the inflation index. So they change the goods that are in there as we change our patterns of consumption. And I think over time, the cost of the renewables that you use to recharge your electric vehicle is going to be lower and more stable than the price of gasoline.

Greg Dalton: Right. And climate people like you and me are banking on that electrification being

cleaner, et cetera. However, in the Bay Area where, you know, I live, electricity prices have gone up 38 percent in three years. Partly that's because the utility's been causing fires. They have to underground wires. So the rising cost of electricity puts at risk some of this clean, smooth pathway to electric mobility that a lot of people have been talking about.

Nick Stern: Yet the pricing of electricity in many countries is done in strange ways. I mean, in the UK, it's linked to the price of natural gas. When, you know, more and more of our electricity is being produced through renewables, but the price rules on the regulatory side link it to the price of gas because they think of that as the marginal source of extra energy, but that's changing. And I do think our pricing rules are going to have to change as a result. An awful lot changes if you have sensible climate policy, and that's just one example, but a big part of that is the investment we have to make to change our ways. So we have to build our grids in a different way. In the UK, we've got a lot of offshore wind, and of course the offshore wind is located in one place. Whereas the coal fired power stations were located somewhere else. So you're going to have to have quite a lot of investment in the grid in order to enable this very low cost form of electricity, onshore wind, even cheaper than offshore wind. We have to think of climate change and the systems change that we make as requiring investment. Now that investment is really going to drive a growth story, but that investment has to be financed. So there are going to be shorter run changes in price as a result of the investment we have to make. But we have to realize that this is a big investment with big returns in terms of lower cost and less instability in the future.

Greg Dalton: That’s Nick Stern, former chief economist of the world bank. We’ll return to my conversation with him later in the show. But as we talk about all the ways climate can impact our wallets, we want to spend a moment talking about supply chains–those complex, multidimensional webs that connect us to factories and companies all around the world.

Ariana Brocious: We all remember just how disrupted those chains got during covid, when we had shortages of all kinds of goods – and how very long it took for things to get back to a more normal operating mode. But if we thought covid disruption was bad, climate disruption might be even worse.

Lea Borkenhagen: Supply chains work when they are predictable, and this is the key thing that we're seeing with climate change is that it's building an enormous amount of unpredictability into how supply chains are working.

Ariana Brocious: This is Lea Borkenhagen, senior vice president at EDF Plus Business. We talked about how climate change affects both the quantity and quality of food that is grown around the world. And even after food is harvested, those disruptions can impact how food gets to our plates. Take, for example, one of the most popular foods all over the world: rice.

Lea Borkenhagen: When we think about its transportation from, let's say, a farmer's field in Asia to your doorstep in New York, what happens is that it goes on a ship across the ocean. That ship often will go through the Panama Canal, for example. It's like this little teeny passage, like really literally the size of, in places, the size of the ship itself. And the ships carrying these containers and containers of food and other products that we're going to buy, they go through that so that they don't have to go from Asia all the way down, past the bottom of South America and then up the other side –

Ariana Brocious: Yeah there was a story about this just recently, right? And it was drought that was like dropping the water volume, right? So they couldn't get as many ships through the canal.

Lea Borkenhagen: That's right. The drought has been going on for some time. It's one of the

wettest places in the world, Panama. And they rely upon that because the water, fresh water in the lakes they use to basically push the ships through the canal. And it's an enormous amount of trade. 270 billion dollars worth of trade goes through the canal, annually. And, you know, almost half of that is going to the U.S. And right now they've reduced the number of ships that go through by a third. So it's gone down from about 36 to 24 a day. And that impact on global trade is enormous. So you look out from the Panama canal, you've got many dozens of ships waiting there to go through the canal. And that has a knock on impact upon, both what returns traders and producers can actually get for their goods that they're selling, but also for the consumers. When we actually want to go and buy something, it might not be there. It might just be stuck somewhere waiting to go through the Panama canal. And then that ends up delaying all sorts of processing that might be done on the other end, when it arrives in the U S before it comes to our doorstep.

Ariana Brocious: Mmm. What about other consumer goods? Where are we seeing inflationary pressures from climate? Thinking about things like clothing or maybe, gadgets, consumer electronics?

Lea Borkenhagen: Well, the products that we buy day to day, t-shirts, electronics that we use in our kitchen and so on, they're all produced in manufacturing facilities around the world. And different places around the world are experiencing climate change, climate heating, flooding and so on in increasing frequency and increasing intensity. So for instance, goods when they're manufactured in Thailand, let's say your t-shirts will sit, all packaged, nice, made, fully finished, ready for delivery. They will sit in a loading warehouse or a logistics warehouse before they go to the port and then be taken off for transport across the world. And of course, remember that these manufacturing facilities oftentimes are relatively near ports. So they are in lowland areas. And so flooding is really possible. And what we've seen is that flooding, in areas like Bangkok, in areas like Jakarta is increasing and companies that are selling their goods into international brands, those goods are getting lost due to things like flooding. At the same time, there's also other really important things that make a substantial difference to how goods are manufactured. And of course, one of them is the people, the people who are actually working in these manufacturing facilities. And if you imagine these facilities, they're like hangers, enormous airplane hangers full of people working, you know, at their station, moving their widget along from one place to the next to be produced, whether it's an electronic thing or whether it's a piece of clothing, they will, be sitting in that place. It's not able to do what we might do, turn on the air conditioning. But in fact, that aircraft hangar of a factory is baking because it'll have a metal roof, they might have some good ventilation systems. They might have fans that blow, et cetera. But when we talk about the human body, we don't have an enormous amount of resilience in the temperature ranges that we can work in. And so there has been substantial amounts of loss to heat exhaustion, and extreme heat conditions that workers are working under.

Ariana Brocious: And that's so dangerous for those people, as you said, I mean, it's one thing to impact productivity from this kind of detached sense, but these are real humans, real lives, people that are suffering and having corresponding health issues as a result of that exposure to extreme heat. We often talk about the climate crisis impacting those in the global South first and worst, right? It's incredibly unfair. Those who have not contributed are suffering the impacts now. When we talk about things like agriculture and just basic sustenance, how are these climate impacts increasing costs for people who are within the global south and, and, you know, not necessarily even exporting their goods abroad?

Lea Borkenhagen: Rice is an excellent example because it's a product that is both consumed locally and it's sold into the global market. And what we saw in Pakistan in 2022 was absolutely devastating. The floods from the Indus River killed 1600 people and it decimated 15 percent of the rice harvest. When we look at that in terms of local price impact, it's enormous because for rice

producers, those who can still sell on the market might prefer to sell it on the global market and make income from it. And that will take away from the local market. And what we saw was that price increases, you know, increased hundreds of percent, essentially overnight after that flooding because the rice was not available for the local market. It was being sold globally, but also what was left was a smaller amount. And so the basics of supply and demand. There's less available, but the demand is still there. And so the price was going up. And for people who are in that situation, I mean, particularly people who lost so much, money is a real issue. And so the price, when it has gone up from 1 a bag to 5 a bag of rice is prohibitive.

Ariana Brocious: So, are there any specific examples of companies working to avoid these impacts in their operations if there are ways they're able to?

Lea Borkenhagen: Pretty much every company that is engaged in global supply chains right now is trying to figure out how to smooth their supply chains because of climate risk. The climate risk is disrupting the ability to be predictable and to plan. And what companies are investing in is mechanisms, technology that will help to be able to improve the kind of predictability that they can have in their supply chain. You can imagine a lot of opportunity around AI, different kind of modeling, so, you know, they might not have looked to understanding atmospheric weather patterns, but now they're looking at those daily to be able to inform what kind of decisions they should be making.

Ariana Brocious: And I think in some cases there are companies that are, let's say, avoiding the concerns around shipping by ocean and instead moving to air transport, right? Which has more emissions, can also be more expensive. Could you talk about some of those, you know, kind of alternate paths companies are taking?

Lea Borkenhagen: Yeah. I mean, let's say you have a product that needs to be shipped for a particular date because it's a season. You're a fashion company and you need to make sure that your coats are arriving for a particular season, otherwise you're going to miss an enormous amount of your sales. You have to figure out how to get those coats there. And supply chains, the amazing thing about supply chains is that there's just a multiplicity of solutions of what you can do when a supply chain is disrupted. One thing that companies do a lot, if they can afford it, and if it's very important for their market, is to use different means of transport. So they'll put on the plane, a whole set of those coats that need to be there for that particular seasonal kickoff. And that means yes, more air freight and the air freight is going to increase the amount of greenhouse gasses in the air compared to if you could keep them on the ships. But keeping on, on the ships, of course, means that you have to be predictable and that's the challenge of climate change. So it's this real irony that the thing that is causing us to experience climate change is more greenhouse gasses. And yet in order to adapt and cope with all of the changes that we're facing because of the climate crisis, we're creating in some cases, more greenhouse gasses.

Ariana Brocious: To be frank, that dilemma seems to be at many points in the climate crisis that does a balancing of how to solve something without adding more emissions. Lea Borkenhagen is Senior Vice President of EDF Plus Business. Thank you for joining us on Climate One.

Lea Borkenhagen: It's been my pleasure. Thank you.

Greg Dalton: Back in the 70s, there was a car commercial on TV that’s still ringing in my ears…

CLIP: You can pay me now, or you can pay me later…

It’s resonant because it’s true. And I think about that when pondering whether my 20-year-old roof

can weather another winter of heavy rains without springing an expensive leak.

Coming up, how the investments we make **now** in our highways, energy systems, and other infrastructure will be critical to navigating the road ahead.

Nick Stern: We have to think of climate change and the systems change that we make as requiring investment. But we have to realize that this is a big investment with big returns in terms of lower cost and less instability in the future.

Greg Dalton: That's up next, when Climate One continues.

This is Climate One. I'm Greg Dalton.

Ariana Brocious: And I'm Ariana Brocious. So we've talked about some of the ways climate disruption is making things more expensive for all of us: in terms of food prices, consumer goods and insurance.

Greg Dalton: So many ways. Now I want to turn back to my conversation with economist Nick Stern about how climate is impacting the economy writ large.

Greg Dalton: In 2006, he wrote the Stern Review, a report from the British government that garnered international attention. It is one of the most significant studies of the impacts of burning fossil fuels on the global economy. And one of the central points was that it would cost **1** percent of global GDP a year to **address** climate change. But if we didn't do it, the cost of inaction would be **20 percent** of global GDP.

Ariana Brocious: Wait. I have to stop you right there. If we don't take action, it's going to cost 20 times as much??

Greg Dalton: An ounce of prevention… I wanted to know where those numbers stand today, nearly 20 years after Stern published that report.

Nick Stern: Greg, we've delayed and we've delayed. And so I think we have to invest a little bit more now, because of that delay. Actually, the opportunities for that investment are pretty strong because there'd been so much technical progress. I had no idea when we were doing the Stern Review, nor did anybody else that in those 15, 16, 17 years, depending when you date it, but those 16, 17 years, I have seen a dramatic fall in the cost of renewables down by a factor around 10.

Greg Dalton: Are you saying that technology dropped faster than you predicted?

Nick Stern: Yes it did. And I don't think we predicted and neither did anybody else that all the major car manufacturers in the world would see the end of the internal combustion engine as not far away. Indeed planning for it within the next 10 or 15 years. We didn't say that either. The electric car is now more or less a similar price than the internal combustion engine vehicle, but already cheaper over the lifetime of the car. Those changes we didn't forecast and they've made life a bit easier. A lot easier actually, but what we have not done is invested in the clean quickly enough. And that means that we have to up the investment. We have to do it faster than we should have done. Had we given ourselves more time, we'd have been able to do it with less intense investment. So the investment intensity we need has probably gone up to a couple of percent of GDP. But the returns to that investment have actually gone up because the technology has meant that it's so much more productive than it would have been.

Greg Dalton: One of the things that's happened to accelerate that investment is the Inflation

Reduction Act in the U. S., which spurred a similar response by the E.U. Of course, that was titled to reduce inflation when people were screaming about inflation in the headlines every day. But there isn't evidence that the IRA has actually done anything to cool inflation. Was it oversold or misnamed or just –

Nick Stern: It's producing cheaper power, cheaper electricity, cheaper vehicles over the next 15 or 20 years.

Greg Dalton: So it's too soon.

Nick Stern: Yeah, I think it is an inflation reduction act, if you take out 15 or 20 years, it's a bit of a misnomer if you're talking about the, you know, the next year, but it had a tremendous effect in really pumping up the investment that we're going to need for a cheaper form of energy in the future and a less volatile form of energy in the future. And of course, it increased employment in the jobs of the future in the United States. So the United States is building skills, the skills of the future, the skills of the 21st century. And you don't want in the 21st century to fall back on the skills of the 19th and 20th. It's changing, and we are changing it and the IRA has been a major step in that direction. I really think it's been a force for good.

Greg Dalton: Right. And there's been Biden administration has made some choices on going with American, which might cost a little more, take a little longer than cheaper imports. So they're balancing jobs and inflation and inflation has come down. It peaked in the US around 8%. Though a report from the European Central Bank says that climate could add 1 percent annually to overall inflation. Other than the areas we've discussed, is that still hold about 1%? Climate's going to add to –

Nick Stern: It could, it could easily in, in the sense right across the board, you know, whether you're talking about transport or food products, the changing climate makes life more difficult. More floods. More insurance, more repairs. Now those are big deals. You know, fires are incredibly expensive. But what we're seeing now, and I think the Inflation Reduction Act is showing it, and it's the way in which I see things differently from the Stern Report of 15 years ago, is the growth story. It's still true that the cost of inaction is very large and the cost of action is not that much relative to the cost of inaction. But what we're now seeing is that there's a tremendous growth story out there. If we make the kinds of investments that the Inflation Reduction Act is, promoting. What you're doing is pushing innovation along very strongly. You're investing in the areas where the innovation is the more powerful. They're tremendous economies of scale. Huge health benefits. We're talking about five or 6 percent of GDP being lost in the air pollution that all this creates. It's huge. It's huge. A very interesting World Bank study on that, looking across the world. In rich countries and in poor countries, those kinds of damage is there. A lot of this is about efficiency. Efficiency is productivity is growth. Our economies are energy inefficient. They're wasteful of resources. And all these are areas where if we really focus on efficiency and cleaner and on the new and innovatory goods. You're seeing that this is a big growth story driven by the right kind of investment and that's the way I see it now, I see what we have to do not as a cost. I see it is in large measure in investment that's going to give us growth and more healthy countries around the world as well as drastically reducing the terrible risks of climate change.

Greg Dalton: So as we pull this together, how are the effects of global heating impacting economic growth?

Nick Stern: They make growth slower and they make life more difficult. You have to build in different ways. If you have to build your highway two meters or, you know, six, seven feet higher than you otherwise would, it's more expensive. If you have to, build your flood defenses, in a much

bigger and stronger way, that is more expensive. If people are disabled through the pollution and through the extreme weather events if they're able to work less efficiently. It's growth. You know, the fires in California, I mean, first and foremost, they devastate people and their health and their lives. But if you're going to be a nerdy economist and add up the growth part, it's a major hit to economic activity and growth. Our systems are designed for a world that used to be, and that world's changed on us.

Greg Dalton: Right. You think about all the hospital costs, soaring healthcare costs and how wildfires and respiratory and other diseases are driven by burning fossil fuels, or we pay for it lots of different ways. A lot of people say they can't afford it. Don't know that they'll be able to afford to retire for those who are thinking about climate inflation, whether it's 1%, et cetera. You know, what does it mean for retirees who don't have a state pension fund? Like maybe some European countries have, that's another aspect of this. Oh, climate is going to get more expensive. Will I be able to live in a climate disruptive future and save enough money?

Nick Stern: Well, they'll be vulnerable wherever they are. They'll be vulnerable to the fires. They'll be vulnerable to the storm surges. Old people tend to find intense hot weather more difficult. So, if they live in a country where there's air conditioning, they're gonna have to spend more on air conditioning. All these kinds of factors make life more disruptive and more expensive. And it's not simply the cost, it's the anxiety that comes with it. I guess if you're going to be really cynical, it means that you're going to die earlier than you need to save less for your retirement. But that's not an argument that I'd like to push. It's all the anxiety and the vulnerability and the pain associated with all this, that makes life more difficult and more expensive.

Greg Dalton: Right. So in the Stern Review which is that 2006 report we mentioned, you wrote that a world with 5 to 6 degrees of temperature rise from preindustrial times was a possibility. Do you still think that today? Have we made progress in avoiding the worst, darkest scenarios?

Nick Stern: We've made some progress. When we did the Stern Review, I think five or six was a possibility, and now we have to say that three or four is a real possibility, because we have changed, and that is important. But something else has happened, is that we've understood that three and four degrees is still worse and still more horrible than we thought. So the range might have come down a bit, but our understanding of the consequences, say of three degrees, is now much deeper than it was before. And it would be horrendous. Hundreds of millions, perhaps billions of people would have to move and imagine the conflict associated with that and you couldn't turn off the reasons. We haven't been at three degrees for maybe three million years. You know, Homo sapiens has been around for one quarter of a million years. We haven't been at three degrees for three million years and then sea levels were 10 to 20 meters higher than now. The damages to us would be absolutely horrendous. And that movement of people would be terrible. So we have made good progress. And I now think that this new growth story and development story that we can describe, not growth forever. We're talking about the next 20 or 30 years as we make these very attractive investments. That growth story could be very strong, new opportunities, innovation. Much more efficient, cities where we can move and breathe and be productive, ecosystems which are robust and fruitful. That's what we have in our hands. You have to invest though. We must remind ourselves, you've got to invest to get there. And our task is to accelerate down that track and realize this enormously productive, cleaner, more efficient, growth story of the 21st century over this next 20 or 30 years.

Greg Dalton: Thank you, Nick Stern, for sharing your insights on climate inflation and the path forward.

Nick Stern: Thank you, Greg. It's in our hands. It's up to us.

Greg Dalton: On this Climate One… We've been talking about how climate disruption is making life more expensive. In a couple weeks we'll do a deep dive into how the Inflation Reduction Act is doing 18 months since it passed. Subscribe to our show wherever you get your pods to make sure you don't miss it.

Ariana Brocious: Climate One's empowering conversations connect all aspects of the climate emergency. Talking about climate can be hard-- AND it's critical to address the transitions we need to make in all parts of society. Please help us get people talking more about climate by giving us a rating or review. You can do it right now on your device. Or consider joining us on Patreon and supporting the show that way.

Greg Dalton: Brad Marshland is our senior producer; Our managing director is Jenny Park. Ariana Brocious is co-host, editor and producer. Austin Colón is producer and editor. Megan Biscieglia is our production manager. Wency Shaida is our development manager, Ben Testani is our communications manager. Jenny Lawton is consulting producer. Our theme music was composed by George Young. Gloria Duffy and Philip Yun are co-CEOs of The Commonwealth Club World Affairs, the nonprofit and nonpartisan forum where our program originates. I'm Greg Dalton.