

Rajendra Pachauri and Lisa Jackson

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Greg Dalton: From the Commonwealth Club of California, this is Climate One, changing the conversation about America's energy, economy and environment. I'm Greg Dalton. Our guests today are Rajendra Pachauri, chair of the U.N. group of climate scientists, and Lisa Jackson, vice president for environmental initiatives at Apple. Moving from fossil fuels to cleaner energy is one of today's biggest challenges. It's also a huge business opportunity that is already generating new wealth. But scientists say the transition to renewable power and more efficient markets needs to happen faster or Americans and everyone else will be living in a world of hurt. Over the next hour, we'll talk about the path of cleaning up capitalism, what Silicon Valley can do to make clean power cool, the role of science and business, and more. Along the way, we'll take questions from our live audience here in San Francisco.

Lisa Jackson is a chemical engineer and career civil servant who ran the Environmental Protection Agency in President Obama's first term. As vice president of Apple, she now leads efforts to make the tech giant more green. Rajendra Pachauri is an industrial engineer and economist. In 2007, he accepted the Nobel Peace Prize on behalf of the Intergovernmental Panel on Climate Change, which he chairs. He also chairs the Energy and Resources Institute in New Delhi and holds a position at Yale University. Please give them a hearty welcome at Climate One.

[Applause]

Greg Dalton: Welcome both. Dr. Pachauri, let's start with some light and give us some good news about where progress is being made in the war on climate change. What's going well?

Rajendra Pachauri: Well, I think progress is being made right here in California. I mean, this is a state which is doing remarkable things, and as I always have put forward the view, this is not only a model for the U.S.; it could be a model for the world. And it shows how people and the leadership of any society working together on the basis of knowledge and information that tells you what will happen if you don't take action and how attractive it is to take action is really what makes this state unique. And there are lots of other cities, towns, companies, businesses, individuals that are doing a lot. Of course, we need to scale up all these efforts because we don't have the luxury of time. We really have to move rapidly and we have to move adequately to deal with the challenge of climate change because if we don't do that, then I think the costs and the feasibility of getting to a pathway that gives you less than two degrees Celsius increase in temperature by the end of this century may go beyond our reach.

Greg Dalton: We'll get into some of those things. Lisa Jackson, Apple is, by value, the largest company in the world obviously headquartered in California. What are you doing at Apple to make it part of the solution, the leadership that Dr. Pachauri just mentioned?

Lisa Jackson: Well, I think the most fun part of my job is watching what happens when the innovation that is Apple, that is sort of in the DNA of the place, is put to the challenges of climate change, the challenges of working responsibly with respect to the environment around the world. And the advantage of being a global company in part is the global reach that that affords. The sweet spot for Apple is innovation and showing the world that not only can it be done but it can be done profitably and it can be done in a way that very much goes along with our desire to continue to

grow as a company, and to grow as a maker of really innovative products that can help everyone and inspire folks to leave the world better than we found it. So there's plenty to be done by the private sector in addition to government.

Greg Dalton: Apple products are known for empowering individuals and there's sometimes a tension in climate change what an individual does, does it matter and it softens what of a collective action, meaning that people need to do things together. So how do you think about empowering the individual on something that requires people to work together?

Lisa Jackson: Well, I mean, this is about empowering individuals to do the best that they can and sometimes that's going to be collectively, but it's also about the individual choices that we all make every day from where we live to how we get around and those decisions. So I think there's an education component that's really fun. You know, I tell people all the time I don't feel like I lost any of the ability to speak to this issue in terms of reaching people when I moved from the public sector to the private sector. And I also think that in many ways it becomes an opportunity for a company with the reach that we have to make big changes, that scale. I mean, this is about scaling the issues of climate resolution, the solutions -- when we scale the solutions, as Dr. Pachauri said, that's how we suddenly find that all of a sudden things have gotten much better, much quicker.

Greg Dalton: And, Dr. Pachauri, a lot of the policy world is focused on what governments can do or should do. What do you see as the role of business, Apple, other companies in tackling climate change given the constraints they have to their shareholders?

Rajendra Pachauri: Well, I think you really need to look at it firstly as a long-term challenge. And even if you look at the history of businesses anywhere in the world, it's those businesses which had a vision and that were able to foresee the future that actually turned out to be far more successful than others that only worried about the profits in the next quarter. So I personally think that you need all stakeholders to be on board. You certainly need government. Government has to set in place policies that enable action in this area. And you need businesses with vision, with leadership that focuses not on immediate and short-term benefits but looks at what its standing with society would be. And I have a feeling that today reputational value is really important for a company. When the public demands companies to be more responsible in terms of protecting this planet, I'm sure that will also translate into value in the stock market.

Greg Dalton: Lisa Jackson, Tim Cook, the CEO of Apple, created quite a stir last year when he responded to a call, I think it was either an annual earnings meeting or a call for someone, shareholder meeting, someone criticizing Apple's expenditures on clean energy. And he said, "If you don't like, if you're disinterested in bean counting basically, get out of this stock." So how does Apple balance long-term investments in clean energy and the quarterly demands of Wall Street?

Lisa Jackson: Well, first off, it's probably good for this audience to get a sense of just how invested in clean energy we are. We run data centers. We actually run four of them; all four of those data centers run on 100% clean energy today. Whereas a lot of people are setting goals for how we want to move our data and the cloud to be clean, Apple's section of the cloud is clean today. That didn't happen by accident. And although I'd love to take credit for it, we were well on our way to doing that before I got to Apple a year and a half ago.

And so you start first with the kind of innovation that's required to take a challenge, and certainly that is a challenge, and say, "We're not gonna be held to what's been done in the past. We're gonna just go ahead and prove that it can be done." That takes innovation. And then you have to say -- you have to really believe that there's no need to choose between a thriving economy and growth, and doing right by the planet and its people, our customers, our employees. When you believe those two

things, it moves business to have to innovate. And I think the last time I was here one of the things we talked about is that as important as government is, it's so much easier to make policy when business has shown a way forward. When somebody has said, "Hey, you know what, we actually can figure out a way to deal with automobile emissions with this thing called the catalytic converter," all of a sudden the head of the EPA can then say, "Well, then let's cut down on the amount of pollution that you can put out," because we know you can do it because we now know how to do it.

So what business can do is innovate and find the hows that allow policymakers and regulators to then set the floor. I think one of the fun things about being on this side of the table is that if you take the requirements as a floor, the future is pretty unlimited in terms of what the feeling can be.

Greg Dalton: One thing that other tech companies do, Google and others, is they actually make direct investments in clean energy. Apple has a very healthy balance sheet, what, \$100 billion in cash. Have you thought about using Apple's economic muscle to either directly invest in clean energy or to divest from fossil fuel?

Lisa Jackson: So what we've said is, first and foremost, Apple has done a pretty good job, I think the best in the industry, of really looking at what our entire life cycle analysis, carbon footprint is. And there's a couple of things that we do there that I think lend themselves to real innovation. The first is that we take responsibility for the carbon emissions of our entire supply chain. And of the 33.8 million tons of greenhouse gases emitted in our carbon footprint last year, about 70% of that is not at a facility that has our name on it. It's someone in our supply chain, all the way back to the ore that's in our products, right? So we have tons of work to do if we say this is our responsibility to help move our supply chain along. And, in fact, that's what Tim said recently when he was at Climate Week in New York City. He said, "Watch the supply chain space." That's where we know we can take our leadership and now transfer it along to companies that do work for lots of people, not just Apple. And I think that's important.

The other thing we do is we take responsibility for our customers' use of our equipment. So every time you turn on your iPad, and it was an iPad --

Greg Dalton: It was.

Lisa Jackson: -- we are calculating the carbon emissions for that. It depends on where you live and what your energy mix is. And we're trying constantly to find ways to first make sure that it uses as little energy as possible because the cleanest energy is the energy you never use. But then it gives us lots of ways to think about how we might try to start to attack your carbon emissions on your behalf, and that's how you get to a clean data center. When you work in our section of the cloud, you don't have to worry about your carbon footprint.

Greg Dalton: And a lot of companies don't take that responsibility for their customers' use of their products. But just one last chance on divesting from Apple's cash or using the balance sheet, the financial to directly invest.

Lisa Jackson: Well, you know, the other thing is that we do have, at least up until now, we've had a different philosophy which is we wanted to make investments in clean energy and we have lots of investments in clean energy. We own the largest non-utility solar farm in the country right now, is the solar farm that we built and now own in Maiden, North Carolina. And we're actually adding to the size of it. It's 110,000 solar panels, enough to power 14,000 homes and we built it to run our data center. So we've invested in clean energy, but unlike others, we've said up until now we want those investments to be tied to an Apple use, to be for our business purposes. We're 94% renewable in our corporate facilities and data centers; we want to get to 100%. Now as we start to look at

other parts of our carbon footprint, including our supply chain, I think it does beg the question of where we go next. And so I'm not going to say it's off the table.

Greg Dalton: And last thing in this topic, you're new headquarters in Cupertino, is it going to be green as possible?

Lisa Jackson: Yeah. Tim Cook, our CEO, has said that it's going to be the greenest corporate campus in the world. We have some pretty ambitious goals. It is a carbon-neutral project. It's designed from the ground up. It's got innovative air-handling capabilities so that the hope is that the majority of the time down in the valley we won't need any conditioning of the air. There'll just be a lot of movement.

One of my favorite stats about the facility is that right now -- or no longer, but when we got the property, it was an old HP headquarters, or an HP building. It was 80% impervious surface and we're going to almost flip that on its head. It will be about 80% pervious, green, and then the building will be somewhere -- it's a little north of 20%.

Greg Dalton: You're listening to the Commonwealth Club Climate One. I'm Greg Dalton. Our guests are Lisa Jackson, vice president of Apple; and Rajendra Pachauri, chair of the Intergovernmental Panel on Climate Change. Dr. Pachauri, we talked about divestment. Recently 300 Stanford professors wrote a letter asking that Stanford divest. It's happening among churches and universities. You used to serve on the board of an oil company in India. How do you view divesting from fossil fuels? Is that meaningful or is that just a symbol?

Rajendra Pachauri: Well, that was almost a lifetime ago it seems I was on the board of Indian Oil Corporation. And the very first meeting that I attended as a member of the board, I said, "You guys have to convert yourselves from an oil company to an energy company." And there was a lot of discussion as to how do we do that. I said, "Let's hold a retreat where people come with well-prepared presentations on the kinds of options that could be created and pursued." And we spent an entire day and some actions were put in place to get into renewable energy, to bring about improvements in energy efficiency and so on. Well, soon after that, I left the board and I'm afraid things are back to where they were.

But that's often what happens. It takes an individual; it takes just somebody's motivation to get things going. And I think what you see in Apple -- of course, they are very fortunate to have someone like Lisa Jackson at the helm of affairs in this particular field, but clearly this is a case of enlightened leadership. This is what I was referring to. And if we had more of this, I think, as Lisa rightly said, this would also enable government policy being put in place because often what happens is that governments are worried about what business might do and often they have reasons to worry because businesses can be very resistant.

I don't mind mentioning this in public. I had a meeting with Chancellor Angela Merkel in Germany just before the Copenhagen Conference of the Parties and she asked me the question, "How do we get the Americans on board?" I said that one way to do it would be for President Obama to have a dialogue with business leaders in the country. She says, "Yes, I think you're right." I said, "Madam Chancellor, why don't you get your business leaders to talk to some of the counterparts over there?" She shook her head and she says, "No, I'm afraid if the American giant wakes up we'll have competition." I think she was saying that tongue in cheek.

Greg Dalton: So, Lisa Jackson, I think it's fair to say Apple was not an environmental leader under Steve Jobs, but it seems to be coming one under Tim Cook. What can you tell us about his vision? You don't speak for him, but what can you tell us about his vision of -- leadership matters, clearly in

that case?

Rajendra Pachauri: Could I jump in here and say something? It's also a question of times. It's also a question of the awareness, the perceived urgency of taking action. But I'll let Lisa also --

Lisa Jackson: That's okay. Listen, I think -- I always tease that the quickest way to lose my last job was to try to speak for the boss and I think the same is true for this boss because he is very good at speaking on these issues himself. So I'll just say a couple of things. First, we want to be judged by what we do. So you were asking about divesting from stocks. We're divesting from fossil fuel energy. The analogy for us is not the stock. It's when you look at Apple stock, you're looking at a company that's 94% clean energy in all of its corporate facilities. And saying that's just the beginning, saying, "We understand that that in some ways is the easiest thing to do," now we have to start to change that part of the world, which is our supply chain and our customer base which is certainly huge. And so we know we have work to do.

But I don't ever want anybody to think that suddenly I showed up, or even Tim, with the incredible leader on these issues he is, and Apple started. Apple made plans back easily five, six years ago that they thought about a data center and said, "We want it to be 100% renewably powered. And then when the decision was made for business reasons to put it in North Carolina where there was no option to buy clean power like you can in California, you can say, "I have direct access to the kind of power I want and therefore I choose to buy this." We went ahead and said, "Since that's not an option, we'll build one." And we built something on the scale of what a utility would build. That's what's there now.

So that doesn't happen overnight. The difference at Apple is something Tim talks a lot about which is, I think, part of the reason I'm there, is that we understand that we need to talk about it. We need to say to people, "Stop saying it can't be done. Here it is." Or we need to join and understand that our sector as a whole in all the ways that we choose to approach clean energy and in all the ways that we touch people but certainly is Apple has a lot of responsibility to not only show it can be done, to talk about how it's done, and then to stand up on the side of saying, as we do on our website, climate change is a real problem. And therefore, we're not interested in having discussions about that, we want to talk about the solutions. And they're doable and they're economically achievable.

Greg Dalton: And is part of that responsibility because it's a moral issue? Is there a moral dimension here to climate?

Lisa Jackson: For me personally, absolutely. Again, I'm not speaking for Tim, but of course, there is. I mean, for me, it is the moral issue of our times. It wraps in justice and human rights and poverty and the way the world will be for my children and their children, and a belief that I don't want to have to someday ask myself why I chose to go be involved in some other issue. It's not to minimize people who don't choose this as their prime issue, and at Apple we actually work on several environmental issues, not only clean energy and climate. But absolutely when you come to work, you don't lose your humanity. In fact, I think what Dr. Pachauri was saying is that as companies get bigger and touch more and more of the world, the reach is not unlike what a government has and our customers expect. It's not the only reason for what we do but certainly our customers expect us to step up to the plate.

Greg Dalton: Dr. Pachauri, I clearly remember being in Delhi at your conference and there's diplomats and experts from around the world, and someone stood up from the Maldives and the room got very silent. For them, this is an existential issue. These are people who contributed very little, who their way of life in their country is going away. So talk to us about the moral dimension of the Asian-Pacific countries that are threatened by what we've done.

Rajendra Pachauri: Well, I think in the Fifth Assessment Report and particularly in the Synthesis Report which we released on the 2nd of November last year, we have clearly highlighted the ethical, the equity, and the larger dimensions that really should motivate us to take action. And one of them certainly relates to those parts of the world which are really vulnerable and are, in fact, suffering already. One of the points that I'd like to put forward is the clear finding that we brought out in a special report in 2011, which we've also included in the Fifth Assessment Report, the fact that extreme events are on the increase. And two types of extreme events in particular, heat waves and extreme precipitation events.

Now I certainly can't scientifically link any single event to human-induced climate change, but the aggregation, the trend and the entire picture that's now before us and observations going back over time clearly show that the intensity and frequency of these extreme events is on the increase. And if we don't do anything about this problem, then clearly these are going to become far more difficult to manage, so much so that in some parts of the world, we would see that those heat waves which currently take place once in 20 years, by the end of the century, could occur once in two years.

So looking at some of the most vulnerable regions in the world and the fact that they are inhabited by some of the poorest sections of human society, there is obviously a moral dimension to the problem, which we've highlighted in the Fifth Assessment Report of the IPCC. In fact, I might mention the Synthesis Report, in its 50-odd authors, had a philosopher because this is not something which relates only to hard science where you only look at the physical basis. There's human society which has to be taken into account. And that's what we've tried to do. And I think this is where the world has to understand that we will take action and take that action early because otherwise the impacts of climate change are going to become so difficult we could be crossing thresholds and tipping points beyond which we would not be able to retrace our steps.

Greg Dalton: it could get really gnarly around here. Dr. Pachauri is chair of the Intergovernmental Panel on Climate Change. This is Climate One from the Commonwealth Club. Other guest is Lisa Jackson from Apple. I'm Greg Dalton. Lisa Jackson, one of the most vulnerable areas in the United States is New Orleans. You were there during Hurricane Katrina. Tell us what happened, what you did there.

Lisa Jackson: So I grew up in New Orleans, Ninth Ward. New Orleans is -- a decent part of the city actually sits below sea level, so it is protected by levees. My mom's birthday is August 27th -- happy birthday, mom -- and so I had gone down to see her. And we watched the Saints game that night which is, you have to do if you're in New Orleans. I woke up the next morning and found out that the storm which we had heard was heading for Florida had actually turned.

And so thankfully, after some cajoling -- I had to get my brother on the phone, go figure, my baby brother, but he finally convinced her that we had to go. And so I drove her out of New Orleans. I think it was the day before her birthday. I remember putting her in the car; she refused to pack anything because if you grow up in New Orleans, you don't run from a hurricane. That's what the tourists do. They get on a plane and they go or they have a party in a hotel somewhere, and I just said, "Mom, we should just go." And my brother lived in the northern part of the state, so the idea was to go there. So she didn't pack anything and I packed a few things, grabbed just a few things, including the deed to the house. And I remember as we drove off, I went, "bye house," as a joke, trying to get her to laugh. And although the house was still there arguably after Katrina, you can't imagine -- or you can, you can see all the pictures of what a house looks like when it soaks underwater for two weeks or so.

We lived in an area of the city that was traditionally, was actually built during segregation, so it was an African American area. It was middle class and not one of those houses was out of the floodplain.

So every one of them -- the levees broke in the lower Ninth Ward and then the water just filled in. And so there were people who died in our neighborhood. Luckily my mom was not there for that. But she lost everything she had. We lost our home.

And once you've gone through any kind of disaster, any kind of disaster, you can't hear those stories ever again on the radio about a flood in some distant place the same way. When you say that something that used to happen every 20 years or 50 years is going to start happening every few years, you can't hear that and not remember the years it took to get my mom and the family back together, the convulsions of that city over who could rebuild and where they could rebuild, and the threat that the civic society, the society would be pulled apart by people's belief that they weren't going to get treated fairly. And in some ways as horrible as that was and Irene after it, you can't say it was fortunate. What are you going to do when you're the 12th in a row and there's no more money left? There is no cavalry to come running because we don't have it anymore. That's the moral issue.

Greg Dalton: And there's been a lot of it. Dr. Pachauri, there's been some terrible --

Rajendra Pachauri: Since we're talking about sea level rise, let me mention that since the beginning of the last century through 2010, the average sea level rise in the world has been 19 centimeters. That's close to a foot. If we don't do anything about this problem and we don't have additional mitigation, then by the end of this century, we could get sea level rise as high as 98 centimeters. That's almost a meter. So you can imagine there are parts of the world which are barely a meter above sea level, and well before that storm surges, coastal flooding and extreme events are going to make it impossible for people to live in these locations.

Let me also mention that even if we're able to limit temperature increase to two degrees Celsius by the end of the century, that will still be accompanied by sea level rise between 26 centimeters to 55 centimeters. That means even if you're in the middle of that range somewhere, that's pretty high. Let's say 40 centimeters, that's a threat to places in the U.S. And that's perhaps a much more severe threat to other parts of the world.

Greg Dalton: And for people who maybe don't remember their high school metric to English conversion, can you put that in American for us?

Rajendra Pachauri: Well, I have a feeling and I'm not one to make a prediction, but perhaps by the end of the century, America may convert to the metric system. It's taken about 50 years and maybe another 100 years would do it.

Greg Dalton: Some of the places that are most at risk, Florida, others, that's where the politics is hardest on this. So either one of you, there are still people -- Lisa Jackson, you had some interactions with Senator James Inhofe, his state is not a coastal state yet, but some of the coastal states, the politics are really hard on climate where they say it ain't happening even though their shoreline is being eaten away.

Lisa Jackson: So some of you are going to disagree with this, but let me tell you something about Jim Inhofe that I actually respect. I respect the fact that I believe he is saying what he believes, not what he's being told to say or what his funders and primary backers are giving him as talking points. And I may disagree heartily and we happen to have the scientists here, so we can talk science and not have this "I'm not a scientist" discussion, you can't even call it an argument. But what is most troubling are those who know, who for whatever set of reasons are not being honest. And that, I think, is troubling for our democracy and for the path forward. So whether or not --

Greg Dalton: Any names that you could think of?

[Laughter]

Lisa Jackson: I may be gone from Washington, but I'm not that gone. They know who they are. And I think -- you see people flip on this issue. You see all kinds of movement back and forth. The science hasn't flipped. The science has gotten stronger and stronger. So if you see people going back and forth, you wonder what that's about.

Greg Dalton: Let's talk about some of the technologies that you think are most promising. Where can technology -- solar is probably one of the brightest stories out there. There's a lot of solar happening in India. It's advertised all over the place. Let's talk about the bright spots in the technology. Dr. Pachauri.

Rajendra Pachauri: Well, I think what we brought out in the Fifth Assessment Report is the fact that there has to be a very rapid and a very early reduction in emissions. Just to give you some indication. If we want to limit temperature increase to two degrees Celsius by the end of the century, then by 2050 you need a 40% to 70% reduction in emissions over the 2010 baseline. Now that's pretty drastic. What does that mean? It means that you need a trebling or a quadrupling of zero or low carbon energy supply. So that means a sharp change in the energy supply mix that the world is currently accustomed to.

We've also said that by the end of the century, you have to have zero or negative emissions. Now this means that you need substantial improvements in energy efficiency, a large utilization of renewable sources of energy, possibly nuclear if there are societies that want to adopt nuclear, carbon capture and storage, bioenergy with carbon capture and storage. And among all the technologies and all the policy options that are going to bring this about, another important issue is going to be changes in lifestyles and behavior. Now, this doesn't mean that we have to go back and live in caves and wrap ourselves in sheepskin, but what this does mean is getting rid of waste.

Perhaps changes in diet, certainly stopping the waste of food that takes place all over the world.

Greg Dalton: You changed your diet. How have you changed your diet on this?

Rajendra Pachauri: Well, that's a personal decision. Fifteen years ago, I decided to become a vegetarian and I can tell you I've never felt healthier than I do now. But that's a personal decision. I mean, we talked about the fact that I flew in last night and I'll be going back again tomorrow, but I don't seem to feel any loss of energy because I changed my diet.

Greg Dalton: Lisa Jackson, what have you done in your life? We talked about your company, how about your own personal carbon footprint?

Lisa Jackson: I'm sitting here feeling bad. Every 15 months, I become a vegetarian again, but I still am working on it.

Greg Dalton: Well, you're from Louisiana, that's tough. I mean, are vegetarians even allowed in Louisiana?

[Laughter]

Lisa Jackson: Well, listen, and here, too, food is like -- it's an art. The food is great here in San Francisco, too, but, yeah, my mother doesn't understand vegetarian. I think you have to begin with lifestyle choices. My husband and I have chosen now that we're new empty nesters to move back into the city. We like the idea of being as walkable as we can. We've had a Prius now for -- I can't

remember what year we bought it. But as much as possible, we're trying to live those values.

Listen, I think one of the things -- I kind of want to flip us a little bit. I don't want to be Pollyanna, but I think one of the opportunities for technology, for innovation is to give people opportunity to have the life that people want to have but to do it in a lower carbon way. So that doesn't mean that we can't make any changes, but I think one of the things that gets people pretty excited, especially in this area, sort of the innovation capital of the world and I know it at Apple, I think the most innovative company out there, is the idea that we can innovate past a lot of these so-called choices. And I do think that you can look at people's choices, and if given the opportunity, a lot of people choose to be in communities where they have the option to live a less car-dependent lifestyle.

And so when you start to put all that together, you can see almost a very dramatic shift between, say, my generation and my kids in how they look at those issues. They don't look at it like I'm making the choice to do this because. They're looking at it because it's better. In their mind, it's cooler, they like it. That's not to say some of them aren't going to end up living in the suburbs and making choices as they move on into more mature adulthood. But I think they will have a very different -- this is a generation that will have grown up -- there's generations that grow up where electric cars are not just something you talk about and rarely see but are an option, where major car manufacturers are making them, where 55 mile per gallon cars will be a reality, where all of that to them isn't a choice they had to make. It's just the way things are. So that's what changes things dramatically quickly, is that the plate of options becomes bigger and people choose, and they don't always choose because of some moral issue or because of maybe the reasons I would want them to. They just choose.

Greg Dalton: Lisa Jackson is vice president of the environmental issues at Apple. This is Climate One. I'm Greg Dalton. We also have Dr. Rajendra Pachauri, chair of the Intergovernmental Panel on Climate Change. Lisa Jackson, some people would make the argument that there is a collision course between what we need to do on climate and 9 billion people all consuming like Americans, having iPods, like the Apple Watch that you have on your wrist that we all aspire to, that the math doesn't pencil out there for 9 billion people living like Americans as consumers.

Lisa Jackson: Yeah. I know, I've heard that. I think the math pencils out that we Americans don't have everything absolutely right and that we Americans are famous for changing our mind about what we want and when we want it and how we want it. And that American ingenuity about offering and changing the list of choices is just beginning when it comes to clean energy.

I mean, I think for us, when you look at the devices that we all now look at, how much non-digital, how much analogue world has been replaced from a resource perspective and how do you ensure that as you continue to move along the spectrum of a digital world, because we're not going back, you do it in a way that minimizes threats to our planet and to the people who will be here. I happen to believe the answer is innovation and I think people take that for granted. They say it cannot be done because it's never been done. If that's how you say it, then you're absolutely right. Is it the only part of the answer? Are we going to be able to tell everyone they can have the same number of cars and the same number of food? No. But do they want that? No. Not necessarily. And not all Americans want that.

So I think where business has a role, because that's really why I'm here tonight, to speak as business, is at least from us in our perspective at Apple, is to break down those barriers of what is possible. And once you do that, to then say now let's scale it. Let's not just make it possible, but let's make it profitable. Let's find ways that that becomes the new norm and then let's move on to the next thing. And if one of the ways you're deciding what's better is sustainability or the climate or the environment and the planet and its people, then that's an important dimension and that's

what Tim has put into the forefront to me at Apple. He's saying, "One of the ways I want to decide whether this is better than that is to look at the planet."

Greg Dalton: And there's a very good video out there called Better by Tim Cook just showing how these things are cooler, better, and it's worth watching. Dr. Pachauri, India, more than a billion people, a lot of aspiring consumers who want to live like Americans, have the lifestyle that we enjoy, how does that play out in a climate context?

Rajendra Pachauri: Well, let me first mention that in the case of choosing and adopting low-carbon sort of pathway of development, there are huge co-benefits. I mean, the first co-benefit that I'd like to highlight is energy security. The second would be improved air quality at the local level and in general a much better environment at the local level. There's also growing evidence that you get much higher employment from some of these options. And I think, therefore, what you really need is a combination of innovation which, of course, is induced by policy, but also as we discussed earlier, by regional leadership in the corporate sector. But personal choices make a difference. You take the City of Copenhagen. You see so many people using bicycles over there and they have absolutely dreadful weather most parts of the year. So if those guys want to use bicycles rather than jumping to their cars, they've got something going in their favor. No doubt about it.

But as far as India is concerned, yes, there is this growing set of aspirations. In fact, Tom Freedman, who is a good friend, always says even the poorest in India have middle class aspirations. And often you go to a slum, the only thing you find over there is a television set. And the downside of that is what are those guys watching on those TV sets? Soap ops. Which fuel these dreams of consuming more and more, getting a car, bigger house, air conditioning.

I mean, you can't deny people choices that are obviously coming into their living spaces and at their doorstep, but this is where I think Gandhi, in a sense, was right. He was once asked, "Wouldn't you want India to become as prosperous as Britain?" And he responded, "Look, it took Britain to use half the resources of this planet to reach its level of prosperity. How many planets would a country like India require?" So I think if everybody in India wants to live the American dream, then I think there's going to be a problem. And I think we'll see that problem very soon.

So I think the government and the people are realizing that. We had a solar energy mission which was formulated in 2010 for setting up 20,000 megawatts of solar capacity roughly in the next eight years or so. The new government is planning to up that to 100,000 megawatts. Now, that's a stiff target, but it signals the signs of change and a desire on the part of Indian society to deal with climate change effectively. And I think some of us can take a little bit of credit for that because we created awareness and I think people are understanding that it's also a major deviation from values that Indian society has been built on for thousands of years.

So I'm optimistic and I think if some major entities across the globe were to set an example and show that you can develop, you can lead a better existence without necessarily emitting greenhouse gases at the same intensity, that will be a very powerful model for others to follow. And that's where, again, I come back to California. The state is quite remarkable in that respect and companies like Apple.

Greg Dalton: Rajendra Pachauri is chair of the Intergovernmental Panel on Climate Change. This is Climate One from the Commonwealth Club. I'm Greg Dalton. I'd like to ask you both a personal question before we go to the audience questions. You both have experienced quite virulent personal attacks from political adversaries, et cetera. I'm curious how that experience has been for you and also you're dealing with something that's really -- Dr. Pachauri, you say you're optimistic, but this is pretty heavy stuff and how do you keep that optimism. Is it chocolate, yoga, alcohol? What helps

you?

[Laughter]

Rajendra Pachauri: Well, you'll be asking me to make some very peculiar confessions over here, so ---

Greg Dalton: Tell us your secrets.

Rajendra Pachauri: But I think in the ultimate analysis, you got to be sure of yourself. And I think you have to stand up for what you believe in and you have to stand up on the side of logic. Yes, I was subjected to attacks with a particular newspaper saying that I was making millions of dollars and that I wear thousand dollar suits. But all of this was debunked. I got a firm of lawyers in London to sue that particular newspaper and the only way I could commission them is because they agreed to do it on a no-win, no-fee basis. Well, what happened, that particular newspaper settled out of court, they paid this firm £53,000 for their legal fees, published a measly little apology, retracted the article.

And the other thing that happened in New Delhi was one of the national channels interviewed my tailor who said, "I charge 2,500 rupees," that's about the equivalent of \$40, "for stitching a full suit. Dr. Pachauri is such a miser that he has brought me down to 2,200." [Laughter]

So all these aura of my wearing a thousand dollar suit was complete demolished and I felt, my God, here I am I thought people regard me as being well dressed and this guy tells the whole world that I'm wearing very cheap clothes.

Greg Dalton: So quickly last -- Lisa Jackson, how do you maintain optimism in --

Lisa Jackson: I don't want to go after him anymore.

[Laughter]

Greg Dalton: You don't have to share about your clothes.

Lisa Jackson: I don't want to go after Dr. Pachauri. Listen, in some ways it was a little different. My job as head of the Environmental Protection Agency and we have another former administrator here, Bill Reilly, with us, is I said it at the time I was nominated and I'll say it again. It was the highest honor as a public servant to be asked to lead an agency that I had started at. At my first job, I did one other job, but then I spent 15, almost 20 years at EPA and then went back at the end to run it. I started as a staff level engineer. I believe in public service. My dad was a mailman and I believe that was part of my calling. So to be asked to do that job for me was an honor, but it was a job.

You know, when you're head of the EPA, you don't get to make the job. The job is described to you. The laws of this country say, "The administrator shall do this and the administrator shall do that, and the administrator shall and must do that." It doesn't say, "If you wake up on Monday and you feel like it, you should worry about X, Y or Z." And there was a court case called Massachusetts vs. EPA which said that EPA must look and determine whether or not CO2 and other greenhouse gases are endangering public health and welfare to determine whether this country's health and welfare was at stake. That's not a choice you get to make.

So I think in some ways the thing that got me through most of the days was I have a job to do. And I can't do it based on whether somebody's going to like the answer to the question because at the end

of the day, if you don't bring integrity to the job, what's the point of it? And so, yeah, there were days when I just remember thinking, like, who raised you? [Laughter] Who raised you? Your mom does not want you up there doing that. But then you just do your job.

Greg Dalton: Do you miss Washington?

Lisa Jackson: [Scoffs]

[Laughter]

Greg Dalton: Enough said. This is Climate One from the Commonwealth Club. We're talking with Rajendra Pachauri, chair of the Intergovernmental Panel on Climate Change, and Lisa Jackson, vice president of Apple. I'm Greg Dalton.

Holly Kaufman: Thank you for being here. I'm Holly Kaufman. This is a question for Dr. Pachauri. I wanted to ask you about the two degrees which for this audience is 3.6 degrees Fahrenheit, which sounds a lot higher for us, so that might be good to use for Americans. It's a big raise in global average temperature. If it's so difficult for us to get to where we need to, to get to two degrees, if we have to make such drastic changes and we know that after these two degrees or 3.6 degrees, that we will have a lot of calamitous changes on the planet, is two degrees really enough for us to strive for?

Greg Dalton: Is two degrees sufficient? Three and a half degrees Fahrenheit.

Rajendra Pachauri: Well, I think that's something that science really can't determine. I think that's something that society has to decide. But science tells you directly that even with the one-degree increase in temperature, there are certain species that are going to be threatened. Science also tells you with the one-degree increase in temperature, you'll still have sea level rise and sea level rise will continue into the next century. And that there are extreme events that are going to continue and become much worse. So I think what the IPCC is doing is placing all the information that it can come up with, that it can assess before human society. And I think with the level of awareness and understanding that hopefully will be created and is being created we would be able to arrive at a resolution of whether it should be two degrees or 1.5 degrees or whatever.

Greg Dalton: But that's a, yes, social value judgment. Let's go to our next question. Welcome.

Greg Dalton: Let's go to our next question. Welcome.

Male Participant: Dr. Pachauri, despite decades of climate negotiations, I hear that climate emissions are still increasing. So I would like to ask, perhaps in Paris, let's say we have a really successful outcome, how many years would it take before we reach a peak level of emissions even with a good outcome?

Rajendra Pachauri: Well, I think if you really want to limit them to increase to two degrees Celsius, then the peak in global emissions should really not come after 2025. Earlier preferably, because otherwise the cost of mitigation will go up substantially. And the feasibility of coming up with solutions and technologies would go beyond our reach. So I think the sooner we act, the better it would be. And, of course, we'll have to act quite decisively. Because unfortunately, if you look at the increase in emissions between 2000 and 2010, in 2010, the world was emitting 49 gigatons of CO2 equivalent. In the year 2000, it was emitting 39 gigatons. So that means we've been adding 1 gigaton per year over previous levels in this ten-year period. That goes counter to what the U.N. Framework Convention on Climate Change requires. So I think we have to move very quickly.

And the big thing is that you can actually save money in a number of cases by taking the right kinds of actions. I mentioned co-benefits. I also want to mention that we have found that the cost per year would be 0.06% of global GDP or global consumption if we would pursue a path that takes us to no more than two degrees Celsius. So it's not an expensive proposition. It's difficult because we've got accustomed to very, very high rates of growth in emissions. So the turnaround is difficult, but once we decide to do that, the cost is not high at all.

Greg Dalton: We can do this. Let's go to our next question. Welcome to Climate One at the Commonwealth Club.

Female Participant: Hi. Thank you. I'm wondering whether you think climate justice is different from environmental justice or do you think it's a part of it. I think some argue that it's completely different because it affects the entire world, climate affects the entire world and environmental justice focuses on localized communities. But I'd argue that they are a lot alike because of who's affected by climate justice issues. So I'm wondering what you think.

Greg Dalton: Lisa Jackson?

Lisa Jackson: What an interesting question. Wow.

Greg Dalton: It's good to bring the students up, huh? They're smarter than us.

Lisa Jackson: It's an interesting questions. I've never been asked it, so I'm thinking off the top of my head. I definitely think climate is bigger than an environmental issue in many ways. It covers every aspect of an economy, that's why so many people get engaged in debate from food to water to air, certainly air quality, but land use, lifestyles. We've heard it all tonight, so you get a sense of how big an issue and how come so many treasury ministers are just as interested in climate as environmental ministers. So that might be the easy end of the story.

But I just want to focus in on the justice question. I think, as Dr. Pachauri said, there are co-benefits. So when you do something to move to cleaner energy, you get a lot of other benefits.

But when you have dirty energy, you get, a lot bad things travel along with that. So the kinds of communities that have historically been neglected where health is an issue, where asthma is an issue, where water quality and land use is an issue, those tend to track with other issues of income in our country and unfortunately still in many places there are vestiges that also track with race.

And so I think there are very valid and important considerations, they sort of go to the last gentleman's question. I do think about the workers. I do think that we need just transitions and leadership in our country that says as we move, as we transfer -- I'm less worried about corporate welfare as I am about the people who will need training and skill development to be able to live and have a just economic transition for them and their families, and I absolutely believe that's part of the role of government and goes to that vision that Dr. Pachauri was talking about.

Greg Dalton: Lisa Jackson is vice president for environmental affairs at Apple. Let's have our next question. Welcome.

Male Participant: Thank you. My question is also for Lisa Jackson. There's been a couple of questions tonight about the civil society response to climate change called the fossil fuel divestment movement. Here in California, Stanford, after a student and alumni campaign announced it was going to divest from coal stocks, there's a campaign at Tulane University. And you're a Tulane Alumna and member of the board; would you support fossil fuel divestment at Tulane University?

[Applause]

Lisa Jackson: It's a really tough one. And I'll tell you why, because it's personal for me. I went to Tulane University on a Shell Oil Company scholarship. So I don't believe in being a hypocrite and I don't believe in standing up and saying something that's easy and popular. If Tulane University or any university is going to start to make those decisions based on values and certainly you've heard from me that climate to me is the most important value, not for everyone, I think I need to understand fully what that means for that university.

Now I've said it's a moral issue, so I am putting it all out there. But if it was black and white, I would tell you, yes, absolutely. But if it wasn't for Shell Oil Company money, I wouldn't be here. And I work for Shell Oil Company every summer when I was in school and I would not have a degree but for that. Although my mother promised me, my father had passed away by that point, I don't know how we were going to pay the tuition or I would have come out with such debt that I wouldn't have had the opportunity to be a public servant. So these are systems issues and it's hard for me from the background I have to just say be done with it until I know which kids aren't going to get those scholarships.

[Applause]

Greg Dalton: We're out of time, so we have to end it there. Our thanks to Rajendra Pachauri, chair of the Intergovernmental Panel on Climate Change, and Lisa Jackson, vice president for environmental initiatives at Apple and former EPA administrator. I'm Greg Dalton. You can join the conversation on Twitter and podcast of this and other Climate One programs or in the iTunes store. I say that every program. And thank you all for coming and thanks for listening on the radio.

[Applause]