

Questions from Climate podcast

Several of you had excellent questions that stemmed from Episode #9 of Historically Speaking on the Paris Climate Agreement. Here are my responses, formulated to the best of my ability and with some help from my husband, an energy economist and someone who works in clean tech. Thanks for listening, and for asking great questions!

You were talking about how this was not always a partisan issue in America but only became partisan more recently. I know that in a lot of other countries this is still a non-partisan issue so why did this only happen in the US? Do we just have more oil components in the US than in other countries and so more people needed to keep damaging the environment to make a living?

There is some partisanship in climate policy though not as much in climate science in other countries. In general, most countries agree unanimously on the science. Australia is similar to the US in that conservative politicians there practice some climate science denialism as well. In general, though, the US is the most partisan on this issue and yes, that is because of the vested business interest of our oil and gas industry in US politics. The industry holds substantial clout in our political process with the enormous amount of money given to political campaigns.

Solar and wind were mentioned a few times as clean alternatives for energy but I barely ever hear people talking about nuclear power. I know that people hate all things nuclear and Chernobyl was a disaster, but modern nuclear power is a billion times safer (in the sense that it's literally impossible to make something like Chernobyl happen) and more efficient than before (Vox actually has a great video on this). It would be so useful to make nuclear power plants a thing and would solve a lot of problems, but people are just so scared. I feel like climate change is just too massive of a problem to overlook something as useful as nuclear power because of fear. I am confused as to why people would give up this option because of some failed attempts from the past (yes those failures were massive, but we have made it impossible to repeat those failures).

In the US, the issue with nuclear is a long standing issue of fear and now, expense. The public in America is unreasonably scared of nuclear power because of an experience like Three Mile Island, the nuclear plant melt down in New Jersey in the 1970s. The government rightfully was concerned though exacerbated those fears into a level of unreasonableness for the public. Americans are concerned about the security risks of an enemy gaining access to nuclear plants and waste, to the potential leaching of nuclear waste into water, and a possible meltdown. (Chernobyl was a meltdown, though one of enormous magnitude that yes doesn't seem likely to ever happen again.) The concern about safety and security has resulted in lots of red tape (another word for bureaucratic obstacles). Due to all of these regulations, it is economically unfeasible to build a nuclear plant at this point in America.

How are countries reducing carbon emissions? I know that switching to solar or wind is one option and people talk about a carbon tax but I'm probably going to look into what the most popular policies are in different countries later.

Many countries have emissions that aren't increasing at the same rate as they would, though I wouldn't say they are actually reducing emissions. The rate of increase is just lower than it would be if everything was status quo. Any country that has reduced emissions has managed to do so through a transition to cleaner sources for electric power. Transportation and industrial emissions, on average, are going up everywhere. There is an active academic debate about how much deforestation and the addition of forest sinks contributes to the decrease in carbon emissions. (Norway, for example, says they are reducing carbon emissions by buying up forest credits elsewhere, but that is complicated because deforestation is certainly on the rise in places like Indonesia, Brazil, and parts of subSaharan Africa so it's unclear how the math works out.)

What's the renewable energy history of California? I recently learned we get a lot of our renewable energy from Geothermal, and while expansions seem to be occurring again most of the original plants were built in the 1980s, Is there a reason for this?

Great question!! Geothermal was built up significantly in California roughly 30 years ago but with cheap coal coming out of Western plants (like in Wyoming) there was less of a need for geothermal energy and it wasn't cost effective. Now, geothermal is becoming more important for two reasons--1. Because it is a reliable clean source of baseload power, and 2. Because of the availability of enhanced geothermal systems. Further, cheap coal has been displaced by cheap natural gas. (another abundant resource in America after the invention of hydrofracking.)

Most of the renewable energy in California has been historically from hydropower--like the Hetch Hetchy dam in Yosemite. We've also historically had a lot of nuclear though some of those plants are now closing. We were a leader in geothermal for years--the largest site in the country, the Geysers, is in California. In the past decade there has been a huge growth in solar and wind power in California and we no longer use any coal fired power for electricity. Natural gas, though, is still far and away our largest electricity source.

Why are the economics of renewables worse in developing countries?

The economics of renewables are partially worse in developing countries but that isn't about the resource but more about infrastructure and access to capital. The increased cost of renewables in developing countries stems from two things--1. An inability to balance the grid and transmit power (i.e. lacking infrastructure) and 2. Higher borrowing costs for capital. (i.e. \$\$)

How can regular people help? It often feels this is in the control of large companies/governments.

Get a job in climate tech! Use all of your great skills in STEM to make a difference. Or your language skills, and write about it! There are so many good things happening right now. This is likely the future of some of the best jobs. Individuals can absolutely make a major difference!

How did America manage to emit so much CO2 in the relatively very limited time it has existed, and how did China manage to finally surpass it?

America used to be a major manufacturing center and emitted significant amounts of CO₂ then. It also has one of the largest transportation systems on the globe. China has only been significantly modernizing its economy in the past 50 or so years and so it just was playing catch up. China has now surpassed the US in terms of annual emissions, though.

Is it possible to reverse the damage done to the climate and if it is what would it take to do it?

Not in the short term, no. Though adaptation and mitigation offer many opportunities to make lemonade out of lemons. It'll take extraordinary effort though lots of that effort will occur out of necessity (think about the shift in building codes after the 1905 earthquake, for example). And lots of that opportunity is going to make some people very wealthy.

If coastal cities are flooded and the inhabitants have to move inland, space would eventually be a problem for the US. How would they prioritize who gets land and a living space (assuming there's a shortage)? Would race or gender play a role as it did with land in the past?

The US has tons of living space so that isn't the issue. The issue is that the coasts have so much valuable property and assets. Dealing with the valuable loss of real estate and assets will be a huge issue as coastal cities are flooded. And yes, climate change, like so many other issues, is most importantly an issue of justice and equity. Actual coastal flooding may have as much of an impact on communities of wealth as it does on communities of poverty but of course the way in which wealthy communities will adapt is significantly different than those with less means. I think this will be one of the most important components of any successful climate policy moving forward.

Near the end of the installment, Mr. Linden mentions how the most-polluting industries such as gas and oil companies were unwilling to decrease their emissions because another corporation will take advantage of the situation and increase their own emissions could be likened to the prisoner's dilemma, in which believing in the piety of others is not advantageous because said 'others' could profit off of this panglossian belief. What, hypothetically, would occur if all parties involved set aside their greedy ways and chose the altruistic route? Would there still be a loser in that scenario? If so, who?

Setting aside the prisoner's dilemma game, those that will lose are the companies that can't adapt or evolve in a clean tech environment. A perfect example of this is the current coal industry in America.

It seems like there has been a real struggle in generating positive results from the efforts to reduce carbon dioxide in the atmosphere. Have people ever considered different methods to solve the global warming issue?

Yes, there continues to be a significant push to sequester carbon. Carbon can be biologically sequestered through a variety of ways such as reforestation, or it can be geologically sequestered whereby you capture the carbon dioxide and then inject it underground in caverns and holes in the geological space. (There are a few successful pilot projects doing this now, though they are relatively small.) There are also efforts to use technology to create new uses for carbon dioxide, such as using hydrogen and

carbon dioxide to create new forms of plastic or other useful materials. Again, lots of brains are going towards trying to crack the nut on this. I am not one that thinks we can rely solely on innovation to get ourselves out of this problem, but I am very hopeful of all that is being done on this front!

Another issue with the push to reduce carbon dioxide is that the messaging isn't always clear. It is hard to feel the immediate impacts of climate change (though that is getting easier with all of this wacky weather) and it's even harder to see the actual impacts of reducing greenhouse gases. One thing that is immediate, and even more prevalent in a Covid-19 world, is the benefit to our health when reductions are made. In almost all cases reducing greenhouse gas emissions would have a significant impact on improving air quality, particularly in urban settings.

What is a climate neutral world? Can we still reach climate neutrality halfway through the century?

Do you mean carbon neutral? If so, it means that our sources and sinks are equal and there is no net carbon dioxide being emitted in the atmosphere from human activities on an annual basis. This would be very challenging to achieve by mid century, but here's hope!

Do cows create the most amount of carbon dioxide because of their manure?

They do create a lot of methane, which is a greenhouse gas. Do they produce the most out of any other emitters? No, I don't believe so. I am pretty sure that honor goes to the industrial and transportation sector. Certainly though it is worth noting that a seemingly innocuous activity like cow poop is deadly!

When did the world realize this was a real problem. Who made that revelation?

An Irish physicist named John Tyndall first noted that gases like carbon dioxide had a warming effect on the atmosphere. The first paper published about human activities impacting climate was in 1939.

To what extent did politicians who denied climate change actually believe it is real?

Hmm, I'm not sure about this one. Consider calling your politicians to figure this out. My guess is they know it is real but it is more politically advantageous to deny it.

If the politicians didn't touch on climate change because it would hurt their campaign, would it affect them during their term of whatever role? By denying it, aren't they just making it harder for them to deal with when it's gotten worse because they haven't recognized it?

Yes, to your second question. But it only hurts them if they don't get reelected. If they keep getting reelected, and they deny climate change they don't see a clear correlation between the two. Or maybe they do! And that just makes them all the more certain that denying this thing is the best for their political future.

When did climate change become politicized? (I know you said that Theodore Roosevelt was the first environmental president but when did it become a part of a running platform?)

Under the Reagan administration. Reagan made a stand about making sure that the federal government wasn't overly involved in regulation. Most notably, he put Anne Gorsuch as the head of the Environmental Protection Agency (EPA) who was adamant about downsizing the agency. She believed that legislation that the EPA was in charge of (the Clean Air Act and Clean Water Act, for example) overburdened business with too much regulation. She sought to demonize the agency's regulations and was largely successful in those efforts by turning EPA into a bit of a nasty word for the Republican party. From that point forward, conservative and Republican became terms that were more associated with anti environmental legislation, and liberal and Democrat became more associated with environmental legislation.

Why did presidents like Roosevelt and Nixon not act on climate change if it was "discovered" in the mid-1800s?

Climate change was discussed early. (Remember the earliest science suggesting a change in climate was in the 1850s). Though it wasn't a real political concern until a series of Congressional hearings in the 1970s that were brought about by the Jansons and the scientists at NASA, like James Hansen. Though both Theodore Roosevelt and Richard Nixon are our most "environmental" presidents when it comes to the number of major legislation passed during their administrations. Notably, they were both Republicans.

How come oil companies are able to out-lobby all other forms of energy that are on the rise (solar, wind, etc.)?

Money and historical influence. Also, most oil and gas jobs are US based whereas many in the solar and wind industry are based overseas. So you've also got the issue of jobs, which goes a long way with political elections.

Why is American often globalist on issues of war and international aid, but not on climate change?

Good question! I think it comes to what is the most important opportunity for the United States and what is most palatable for the American voter. Doing something about climate change demands real action and will have real costs. (By the way not doing something has the same result but it's much easier to ignore that.) The messaging from climate deniers has been much more powerful than messaging against international aid, for example.

Why did the US withdraw from the climate agreement?

Trump promised the voters that he would get out of the agreement during the election of 2016. He told many voters that getting out of the agreement would help them keep their jobs in the oil and gas industry. He also promised to save coal jobs and that getting out of the agreement would help that. He did remove the US from the agreement and hasn't done anything to proactively address climate change, but

still those coal jobs have been lost. Coal is just not economically feasible in comparison to natural gas and renewables.

Is the Green New Deal part of the Paris-Agreement-related or is it unrelated?

No it is unrelated. The Green New Deal was a response to US inaction on climate change and is about creating jobs.

What are the requirements of the Paris agreement? What does each country involved need to do/what are they agreeing to?

Oh gosh, I am going to go ahead and say Google that!!

Is it really that simple for the president to join or leave the Paris Climate Agreement? Is it only a matter of some kind of executive order?

We got into the Paris Climate Agreement as an executive order signed by Obama. It is a nonbinding treaty that doesn't require any money or distinct action from Congress, so the Obama administration felt it could circumvent the usual route of having the Senate ratify a treaty. Trump nullified that Executive Order and because of the terms of the agreement it took the US more than three years to get out. Presumably, Biden will immediately resign the agreement as an Executive order. It isn't the best way to govern but when Congress is as divided as it is its the next best thing to doing something.

Why would the United States back out of the Paris climate agreement if it's so important?

Politics.

Why did the US bail on the Kyoto agreement?

Politics. And like the Paris agreement a disagreement between politicians about what the right action was to do. There was significant discussion then (in 1997) as there is today that other countries, like China, Russia, Brazil, and India, are significant emitters but haven't been held to the same emission restrictions as the United States in these multilateral agreements. That is true. Though it is also true that the US, like European nations, has had years of unabated emissions and has benefitted from that. Since the industrial revolution the US has emitted significant amounts of greenhouse gases. Thanks to that the country has managed to be an economic powerhouse. Other countries that industrialized later or are still industrializing were given a looser carbon budget so that they could "catch up" on industrialization. Fair just and? Yes. Logical? Maybe. Practical in terms of actually solving this problem? Not really. Politicians got stuck on this last point and rather than have a less than perfect agreement they threw it out completely.

Why did the US not sign the first agreement (or whatever the potential agreement was that you said was organized in the Netherlands)? Was it very different from the current Paris Climate Agreement?

Again, politics :).

When do you think people will take climate change seriously?

I think they are. Our politicians need a lot of reminders, though. Like a lot. They'll respond if enough people call them, write them, and make a big stink about it. Remember we do live in a democracy and they only have a job if we elect them to do it. So our voices do matter. Also, if enough people tell corporations who are supporting climate deniers that they'll pull their support of those corporations, then I think they'll listen too. It is a process but perhaps one of our best challenges for living in a strong and hopeful democracy.