Climate Brewing | Methane Dangers and Solutions

SUMMARY KEYWORDS
methane, permafrost, co2, policies, Canada, oil, industry, earth

SPEAKERS
Susan Oxley, Rod Downing

Susan Oxley 00:27
Welcome to Project Zion Podcast. I'm Susan Oxley. I'll be your host today. I'm from Seattle, Washington in the United States. And this is the series “Climate Brewing, “ all about various topics concerning climate weirding and climate change, climate crises and emergency. Today, I'm here with my good friend, Rod Downing, who is the chairman of the North American Climate Justice Team, and I've enjoyed working with him on that team. We have involved ourselves in a lot of different issues. We've learned a lot along the way, and are really enjoying doing the webinars that you are all welcome to attend. So welcome, Rod.

Rod Downing 01:15
Yes. Thank you. Anyway, glad to be here. Always enjoyable, and always looking forward to discussions on the climate crisis. So thanks for making this possible.

Susan Oxley 01:35
Oh, I'm glad that you're here, Rod.

You know, I've been hearing a lot about greenhouse gas emissions and carbon dioxide for decades. As have you, I'm sure, in the forty years that you've been involved with environmental issues. Just recently, however, there's been a rising interest in articles and in the media, about methane, which is one of the greenhouse gases, but one we don't hear about that much. And now we are. I know from comments you've made to the Climate Justice Team, that you've done some research on methane and enjoy sharing information about it. So I'd like to focus this podcast on that greenhouse gas.

So let's start out with what is methane and why is it important?

Rod Downing 02:23
Yes, thanks for that introduction. The scientific community was no, no different. CO2 was considered the--and is still--the primary problem when it comes to this greenhouse gas, and how it forms and the effects it has. But what they later came to do is say, “Well, what other gases affect this?” And they came up with a few, and methane came at the top of the list now.

So here's how it went, they started with CO2. Then they recognized that—and CO2 as this heat trapping gas. That is, the sun comes through the atmosphere, and it comes through as UV rays. You know, that's why we have sunblock, you know, UV spectrum, sunblock. So it's a very common understanding that we all have because it hits our faces, and it's going to give us sunburn. And so that comes through and… but a lot of it bounces off the earth or even our foreheads, and goes back out into space as infrared. Which, you know, is that heat that you feel from fire or, or, you know, from the earth from pavement when it gets really hot.

Yeah, so that's the infrared going back out into space. And when it does, it hits those CO2 atoms and some of that, some of those CO2 atoms will in fact, bounce that heat back down. And that's how it formed sort of this blanket. So that's the very basics of how it became known sort of as this blanket. That heat--that can heat up the Earth, even though it's coming from the sun and this, you know, and the sun on the way through--it just goes straight through the CO2 atoms. But on the way back up, it's now infrared. So that's the basic mechanism.

And then they came to realize, “oh, no, it's not the only gas that works like this.” When those rays go back up into the atmosphere, if it hits methane, it is, in the first few years of those methane molecules being in the atmosphere, it is over 80 times more potent than CO2.

Susan Oxley 05:40
What do you mean by more potent? I mean, the heat goes up, it hits a molecule, then comes back down. What makes it more potent?

Rod Downing 05:50
Right. It’s a more complex molecule, and so has more ability to interact with that infrared light coming up, and bounce it back to Earth. So in those first few years, it has over 80 times more ability to bounce that infrared back to Earth and thus make it 80 times more potent than CO2 in terms of heating the earth.

Susan Oxley 06:32
So if I understand you correctly, the heat that has been converted from light energy to heat down below, goes up, and some of it passes through the carbon dioxide, but not much of it passes through the methane.

Rod Downing 06:49
Right. But the main thing is just to, was the recognition that it is so much more important, sorry, it's so much more potent as a greenhouse gas. Now, the one difference between methane and CO2 is CO2, is I guess, you could call it a really sturdy gas. There is not much that's going to break it down for hundreds of years. So it's going to stay up there and keep becoming that blanket for hundreds of years.

Whereas methane is only potent, really, at that level for about the first 10 or 12, or plus or minus years. And then it breaks down basically to CO2 and water. So after about 10 or 12 years, it's still going to be potent, but only as potent as CO2, and then it just--and then that aspect, you know, like co2—well, it is

co2--stays up there for, you know, hundreds of years. But its 80%, you know, that overwhelmingly greater ability to heat the earth disappears after those first 10 years.

Now, what's the significance of that? It's that in those first 10 or 12 years, we have this incredible opportunity to have an 80 times reduction if we can reduce the methane. And that's why it is such a key thing in my mind, because wow! If you can find ways to reduce methane fairly easily, then you're reducing an 80 times reduction in that warming that is occurring as we speak--gives us a good decade, to find some of the longer-term solutions for the actual CO2 issues.

And we need a lot of research to, you know, completely get us back to the levels that are going to be safe levels of CO2 in the atmosphere. And that gives us lots of time. So that's to me why, you know, it's a strategic importance. It gives us that--it simply gives us that ability to make a huge impact, which allows us then, a bit of breathing space for the longer-term issues that are going to be much, kind of, more difficult to get to.

Most government agencies, scientific agencies recognize that, too, and are pushing around the world. That is, I live here in Canada, and we're making--trying to make--special policies for methane. While at the same time, of course, putting a lot of research into CO2. And the recent Inflation Reduction Act definitely had methane as one of the key components to target, to try and reduce very quickly, those--that gas—via policy. That's hopeful, if policies end up being substantial--that is, enforceable--and that, of course, gets into the political realm. And that's where we may need to become advocates. If the political will is too weak, the world will need to wake up and advocate specifically for that because of its advantage.

Susan Oxley 11:35
Okay, so, recently, the reason I am aware of the methane is not because I'm a scientist, but because the media has picked up on that. Is that because scientists are publishing more about this? Is it the scientists that are driving the change in focus? Or is there something else that is creating enough interest in methane that the media is picking up?

Rod Downing 12:00
The role of a true journalist is to get down to the truth of the issue and such. But the media corporation, its purpose is to make money for the corporation. And so they'll pick on simply eye-catching stories. And fortunately, I suppose one way or the other, one of the more interesting or amusing eye-catching stories was probably that cows-- You know, they eat the grass and they've got all those stomachs that it goes through? Well, the fact is, coming out the front end--that is, belching back out the front there, their mouth--comes a fair bit of methane. And so I think--I can't say for sure--but my guess would be that, that sort of became an interesting angle. To say, “hey, all our cows are belching out this methane.” And matter of fact, at first, they didn't even realize it came out the front end! They thought it was the back end, which I suppose makes it a little funnier or whatever. But that could be part of the reason.
But for sure, the more serious journalists were looking at the science. And the scientists had, by that time, recognized they can't simply do science. They have got to get people--and climate scientists themselves have got to be translating it into public language that would be easily digestible by journalists, and then the media itself. So it's a combination of factors. But it's simply that it is such a

significant ability to get, you know, to sort of fast track some initial response and lower these emissions. I think, at the end of the day, it would be the driving factor and all of these other things are just kind of interesting aspects to that.

Susan Oxley 14:33
So There's recently been some other articles about methane, concerning the thawing of the permafrost swamp gas, oh, methane pipe leaks. Can you comment on some of those, those newsworthy items?

Rod Downing 14:54
Sure. I mean, on the one hand, that's where some of the really troubling aspects come in. But it's also some where, it's some of the exciting-- Let me start with the troubling ones, in particular the permafrost. So this has to do with the Northern Hemisphere, I mean, Canada, so I definitely know quite a lot--or I'm sorry—I'm aware of quite a lot simply because our news media covers that. Because a good chunk of Canada is in the northern area, which doesn't have much of our, you know, most of our populations within 100 miles of the US border processing and things like that, that are up there.

Susan Oxley 15:46
In 2012, I had an opportunity to go to Churchill, Canada, which is up near the Arctic Circle. And when I arrived there, I was with a group at a science station, exploring what was happening to the polar bears because of climate change. I learned that they had had a recent crisis in Churchill, because the thawing of the permafrost in the few years prior to that had so disrupted the rail lines, where the only train going as far north as Churchill--that brought all of their supplies, their food, their medicines, everything--that had been totally disrupted by the thawing of the permafrost and the shifting of those rails. And it was going to take a couple of years to get that fixed and for the train to be back in operation, if ever, as the permafrost continued to melt. And so they had immediately begun growing hydroponic vegetables, and arranging for supplies to be brought in by airplane. But it was an eye opener to me, for how the thawing of the permafrost affects normal everyday life for those that are in the northern part of Canada.

Rod Downing 17:16
Oh, absolutely. And it's become even--you know, that's over 10 years ago now. And that awareness was always with the Inuit and First Nations people up there, because they live it, and they depend on it. Whereas as I say, for the rest of us who are down within 100 miles of the US border, you know, we had no awareness of, of how quickly things were changing.

So let me make two quick comments. One is the very first person that we had on our series of webinars, he was from the IPCC and one of the original coauthors. [Richard Gammon. His webinar can be viewed among the archives at cofchristclimatejustice.org.] One of the things he mentioned is that the North--the farther north, the faster the warming is occurring. And the Inuit were definitely seeing that long before everybody else. And they were like…
So first of all, let's define permafrost, or at least get, make sure we're, we have a handle on that. So when you're up north, there, you know, they still have a summer where, you know, the flowers come out. You get up above the tree line, there aren't any trees anymore, but still, you get flowers and grass and things like that, just like you would here. But if you dig down deep enough, you only have to go

down a few feet, you're gonna still hit ice. In other words, that layer of soil is sort of like a blanket that keeps that soil that is underneath in a permanently frozen state-- thus, the word perma frost, it's permanently frozen. And they depend they had depended on that for 1000s of years.

And roads, roads were affected the same way. You don't suddenly --these roads were that they depend on during the winter because it's solid and stable. And you can get truck after truck after truck on it or rail line. So yeah, up north, they are noticing changes much faster than here. And one of them is, as you say permafrost. And the other aspect. And here's where the tie in comes back to methane. Is that, that permafrost, when it melts, it has locked in a lot of the methane. Because methane is, most of it comes from plant matter that has decayed in various forms.

Thus, you know, your city dump site is going to have methane, because there's going to be organic matter that decays. Well, that's going to decay into methane amongst other things. And just any normal area that has water that's going to help decay, the matter is going to turn into methane. So there are these huge-- So just think of the entire northern part of the planet all across Russia, all across Canada, and some of the Nordic countries, they all have the same issue, that this methane [correction: permafrost} is gradually melting. And as it melts, it releases that methane. And remember, that's 80 times more potent. So that's another reason it became such a big issue.

That's like a tipping point, well, simply releasing that ginormous amounts of methane 80 times more potent than CO2. Boom! That's like, it's still going to take place over a number of years. But nonetheless, that's a real tipping point that we don't want to reach, because it's going to take us into weather that we don't ever want to see.

So that's why methane is so important. So that's the downside.

What's the good news? The good news is, first of all, we've woken up to it. But the best news is-- Because you can't see methane. Well, where are the sources? Yeah, we know, okay, when the permafrost melts, we got it. We know cows, whenever they eat grass are going to release some of it. But really, the primary source is in the oil and gas industry, because simply extracting oil--what's oil, other than, you know, millions-of-year-old organic matter that has, you know, changed into these other forms of carbon. But along with that is going to be pockets of methane. And so all of the oil extraction that goes on, along with that is going to come methane.

Now some of that they can, they can pipe it, you know, capture it and pipe it and use it as natural gas. But a lot of it, they just flare off. And that's when you see these stacks, you know, these stacks in the middle of this great oil producing, this oil drilling area that, you know, just have these flares going off. Well, that's what they're doing. They're just flaring off the methane, because that's the cheapest, that was the cheapest thing to do with it.

Susan Oxley 23:43
Is it possible to capture it and make use of it?

Rod Downing 23:48

Well, yes, that's part of the solution.

Now, but the first part of the solution, is that because it was odorless, sightless-- Well, nobody really recognized. I mean, they did know that there were leaks in these pipes. But they didn't realize how bad it was, until they actually started using airplanes that could detect these leaks. And it's too bad this isn't--podcasts aren't visual, or I could show you there are these just -- The airplane going along and there'll be a little leak here. And so you'll have, you'll see this small plume, but then you'll see this massive plume that's been going-- Lord knows how long it's been, you know, spewing out methane and nobody knew!

And some of these things, all it requires to fix is somebody with a wrench to tighten down some loose, you know, some loose bolt or something. Now some of it's more complex, but some of it is largely that simple. And in all cases, it's a win/win as long as methane--which, which as a useful gas is simply called natural gas, and is, you know, is a major source for heating homes--that the industry should have some incentive not to be wasted. I mean, that's all wasted, you know. From an oil and gas perspective. that's a wasted resource that's just dissipating.

So there should be some incentive on the industry side to fix all these leaks, so they don't lose all that value.

Susan Oxley
Profits.

Rod Downing
That's, yeah, the profits. Until we can get to the point where we don't need anything, because we can get everything off of renewables, I mean, we've got a long way to go. But that's part of the transition, and for sure to stop those leaks.

Now, we've gone beyond that. The even better news is, we've gone beyond that. Canada has had oh, at least, I'm not sure how many, but a few satellites. We now have satellites that can detect, you know, because-- Of course, if you watch the movies, you've got these spy satellites that can read a newspaper, you know, read the heading of a newspaper and stuff like that. Well, these satellites, couldn't, can't quite detect each cow's amount of methane, you know. It's not down to that level. But it's definitely at the level of any of these leaks in the pipes anywhere that it, you know-- As it circles round and round and round the earth, it can pick them up.

And now the US just this past year has put up the next generation level that can detect methane at incredible accuracy. And one of, some of the reports that came out of that is, "Uh-oh, we thought methane was leaking at, you know, x rate, but we're now discovering that it's almost doubled. You know, we've miscalculated." Yeah, almost double, you know, significantly! Itt is significantly more of an issue than we thought. And so that's part of the reason when, you know, here, we've been trying to reduce our CO2, you know, our greenhouse effect. And gee, it seems to be the hardest thing to get that curve that's going up to flatten and go down. Well, here's one of the reasons why: is because we didn't have the accurate ability to detect methane. Now we do, there is no excuse.

And, personally, if I could make a policy, I would put huge penalties on any industry, where they— where the satellites can detect the methane. And if it isn't fixed within X months, there's some huge, you know-- That's the type of, that's the type of policy that needs to be in place. My gosh, we could drop that level so much faster, if we took methane seriously.

Susan Oxley 28:50
So one of the areas that an individual could get involved and make a difference is, if we, say, wrote letters or emails to our legislators, advocating for stricter policies on methane gas leaks.

Rod Downing 29:08
Absolutely. And like I say, in the inflation Reduction Act, there were some policies. But I simply, because I'm not in the States, I simply haven't followed that in detail to know. I know it is having some effect, but I don't know the ins and out of all the politics and such and, and so don't want to start getting into that aspect. But for sure, it is not a partisan issue. Like I say it is an issue that even for the industry, they could be saving money or making more money if they address this. So advocacy is, for sure, one of them.

These aren't the only areas. I mean, they're the two, two of the biggest areas: the permafrost and-- Well, the biggest one is simply the oil and gas industry leaks. That's by far the biggest. And then the permafrost is simply, it's starting to show up, but nothing like where it's headed for. Like we're talking massive, possible, you know, almost catastrophic changes, if we don't get a better handle on that, because that's going to be millions of square miles around the world that are gradually just going to start, you know, emitting methane. And I don't know how in the world you'd get a handle on that, or turn it into anything useful. That's a, that's one, you just want to stop in its tracks.

But there are other, like, as I say, city dumps, you know, they should be capturing all the methane that comes from there. In every place where there is any type of rotting plant vegetation, you know, due to water or whatever, it is an area where, you know-- So rotting seaweed or, you know, things like this are all possibilities.

Oh, actually, cute little story has to do with seaweed. They found that it doesn't take much seaweed-- Give a little bit of seaweed (and it has to be the right type of-- it's some type of red seaweed), but put that into the feed of cattle, and you reduce their methane output by, I don't know, up to 50 to 80%, I think, I'm a little uncertain. So, you know, they're coming up with very innovative means. And it's just, you know, cattle industry is a huge industry to get it to get full buy-in. Takes time.

Hopefully, I've gotten across the significance of the issue, like for the here, and now. It's the thing that can, that can quickly drop. It can't, it's not enough to get us down to the levels of the Paris Agreement, but it actually gets us fairly close. And the key thing is that, should there be strict enough policies to actually, you know, force this into reality, we need that time to find those trickier solutions. And methane is one of the chief ways of giving us that time. So that's the prime takeaway in my mind is, it is such a potent thing.

The only thing that really, that's more potent--and here is something that you can--a separate takeaway-- is if you have an air conditioner, that'd be using the HCFC's. If they leak, they leak at an incredible potency of a 1000 times that of CO2. So completely separate from methane at 85%. For sure, if you've got a heat pump, or an air conditioner, make sure it stays maintained because if it starts leaking stuff, it's doing it at 1000-fold compared to CO2 in terms of being a green, potent greenhouse gas.

So a bit of a sidebar, but hey, it's all part of the same goal. And, and but methane being so universal in the oil and gas industry, in all the waste that we have, and simply in nature's cycle of, you know, growth and decay. You know, there's so much opportunity there for us. So that to me, is why I focus on it. It's a very hopeful thing. We just have to get over the hurdles that are our human propensities and get it done.

Susan Oxley 35:16
Well, thank you so much. I appreciate your sharing the information that you've had and the research you've done, and the clarity that you've given for how we can best address the low hanging fruit of methane as we try to find some solutions for the greenhouse gas emissions. Thank you very much, Rod.

Rod Downing 35:41
Glad to and thanks for the opportunity.