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CleanLaw 75

EPA's supplemental methane proposal and the use of advanced technologies—January 5, 2023

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Hannah Perls: Welcome to Clean Law from the Environmental and Energy Law Program at Harvard Law School. In this episode, Carrie Jenks, our executive director, speaks with Kyle Danish, a partner at Van Ness Feldman, and Dan Zimmerle, the director of the Methane Emissions Program at Colorado State University. They discuss EPA's recently released supplemental proposal to reduce methane emissions from the oil and natural gas sector, and how the regulatory framework EPA has proposed is designed to enable the use of advanced technologies to better detect and therefore reduce emissions. We hope you enjoy this podcast.

Carrie Jenks: Welcome to Clean Law. I'm Carrie Jenks, the executive director of EELP, and I'm joined by two experts, Dan Zimmerle and Kyle Danish, to discuss EPA's recently proposed rule to reduce methane emissions from the oil and natural gas sector, welcome to both of you.

Dan Zimmerle: Thank you.

Kyle Danish: Thank you.

Carrie: So EPA released its proposal a few weeks ago, which is revised from the prior one released a year ago, and before we dig into the details, including what's changed and where you think EPA is heading on the approaches it's seeking stakeholder feedback on, I think it'd be great for our listeners to hear a bit about your work on methane and air regulations and how we've been working together over the past few years.

So Kyle, you're a partner at Van Ness Feldman, and we've long worked together on Clean Air Act regulations. If you could give a bit about how you've been working on the methane regs to start us off.

Kyle: Yeah, sure, and thank you again for having me participate. I'm a partner at Van Ness Feldman, and for a number of years I've been working on methane policy, all the way back to when the Obama administration started to develop methane regulations through some legislative chapters, and now again, with this EPA regulation and corresponding legislation in the Inflation Reduction Act. I've worked in a number of settings with primarily companies, including operators in the oil and gas industry that are affected by the regulations, and also technology vendors, companies that are developing technologies that can be used for compliance, such as monitoring and

surveying technologies, and I've had an opportunity to participate with you in the multi-stakeholder methane roundtable, which has been a great source of information and understanding and dialogue.

Carrie: Dan, you've been a key expert for me understanding how methane emissions work and the technologies. Could you give a bit about what you've been doing at Colorado State University?

Dan: Thanks again for having me on the broadcast with you as well. So CSU has been working in several areas, so we have a long history of measuring emissions in the field, and we've been focused on greenhouse gas emissions for that period of time, and then secondarily, we've been doing quite a bit of modeling with emissions, and recently we have developed several tools for doing that in conjunction with other universities, and then I think we're best known, probably, for the fact that we are one of the major test centers for leak detection solutions, and we've done probably most of the testing that's being referenced in any of these discussions that we've had over the last several months now.

Carrie: So let's dig in a little bit. EPA's proposal includes a variety of equipment requirements for sources, but what we've been really working on is alternative compliance options and how technologies that are rapidly developing could be used to better detect methane emissions. To explain the emissions from the sector and the challenges, maybe starting with you, Dan, could you start with a background about how emissions happen, and why is this hard to figure out where they're coming from and therefore reduce them?

Dan: There's a long history behind emissions in general, and so much of the regulation around it has been not targeted at methane, but it's been targeted at VOC emissions. So the whole greenhouse gas emission space is kind of piggybacking on this other stuff. So that's produced kind of this interesting landscape where the regulations look at emissions one way and the actual facilities look at emissions quite a different way.

So generally, we think about three classifications of emissions today. So one of those is fugitive emissions. So something that's not supposed to be leaking is leaking or emitting. The second one is what we call vented emissions. Indistinguishable in the real world from fugitive, but it's things that we plan to release. So that might be blowing down equipment or gas power pnuematics, and then the last part is any time you have a combustion process on a site, not all of the fuel gets consumed. So if you're putting methane in as a fuel, part of it's going to come out the stack as a part of the exhaust gas. So you end up with combusted vented and fugitive emissions, and those are classifications that don't exist in the real world. The kind of classifications that exist in sort of a regulatory or management world instead of... you know, downwind, it's all methane.

Carrie: Then the technologies keep evolving too. So could you talk a bit about the classes of technologies and how that's really changed over the past two to three years, even?

Dan: Yeah, I think now we're really talking, since probably the last 10 years, about these kind of next gen methods, and so it's always interesting to say, well, what makes next gen next gen? So the previous generation of fugitive emissions monitoring was what I call the up close and personal approach. So you have a sensor of some sort in a person's hand, you take them close to some potential emissions location, and they try to determine if that fugitive emission's potential is an actual fugitive emission. That's the way it's been done.

So in the last 10 years or so, communications and sensing costs have gone down, and our sophistication about how to use those has gone up. So now we're looking at methods that are trying to detect emissions after the emissions have left the point of origin and are being transported by the wind. So what really makes the next generation methods next gen is that we're now sort of standing downwind in some fashion, and we're using that information we're collecting to sort of estimate where it is, how big it is, when it started, when it stopped, et cetera, and that provides a whole new dynamic around emission detection.

Carrie: You're talking about aerial surveys, satellites, continuous emission monitors.

Dan: Literally, if you could think of a way to move a sensor around, somebody's doing it. So you have three parts. You have a sensor then you have to transport it around or mount it on the site or something. So you have aerial surveys, satellites driving on backs of cars, mounted on robots, mounted on drones, put on posts and fixed in station, you name it. There's all kinds of deployment methods, but they fall into a couple of classifications, and then the last is you have a backend analytics. So all of that data's flowing into some type of complex computer code that's then calculating that estimation of the emission location and rate from whatever your sensor read.

Carrie: So Kyle, switching to you, you and I talk about how EPA therefore has to translate all of this information about technologies and where emissions are coming from. Are they allowable? Are they permitted? Are they fugitive? They've got to translate this into a section 111 box that EPA has under the Clean Air Act. Could you speak about this challenge and how that is affecting what EPA's options are here for the regulation?

Kyle: Sure. Generally for a regulatory agency of any kind, but like the EPA, when you're dealing with something where the technology is advancing very quickly, it's very difficult to come up with a regulatory framework that allows you to feel like "I can enforce this, I know what people will do, but I'm also encouraging people to use new things." That's just very challenging.

Under section 111 of the Clean Air Act, they have a particular set of legal authorities, and what they're doing is they're setting performance standards for sources of emissions, and the performance standards have to be based on the best system of emission reduction that the EPA has determined has been adequately demonstrated.

So in some cases, when you're talking about something that's just emitting all the time, you can say, well, I'm going to figure out the best way to reduce emissions from that sort of facility, and figure out what the corresponding say year-long emissions limit is, and then you're really allowed to use any technology that will get you to that limit.

So there's some flexibility there, which is helpful, but in this particular setting, as Dan was describing, a lot of what we're talking about are these fugitive emissions. They're things that sort of pop up and have to be detected, and they don't lend themselves very well to just an overall numerical standard, and so instead, EPA has to do something like a work practice, or actually like a specific technology, and so in this case, the best system of emission reduction may be the only system of emission reduction you can actually use to comply, and so EPA has to look for one that's adequately demonstrated, and what sort of meets the adequately demonstrated test is the very first level of what Dan was describing, these sort of handheld sensors called optical gas imaging, and there's some other things, and they're very cumbersome and expensive, and generally, people in the industry will say, "This is not the best way to do this," but it's got to be sort of the basis for the regulation.

So stuck with that, EPA is trying to figure out how it can set this work practice technology requirement that's based on this sort of first level of sensor, yet provide incentives and rewards and an opening for people to use some of these technologies that are coming on and advancing and, maybe even in two years, would be considered the best, and those could be aerial surveys, that could be satellites, it could be continuous monitors, all the classes that Dan went through. So it's a challenge to be within their legal authority to set a system-based limit and yet provide an opening for use of these other technologies so that we don't sort of lock in amber something that would not be the best in even a year or two or three.

Carrie: EPA, by statute, they have to revise these every eight years. Regulations take a long time to develop. So I think what we've been trying to think about is, how could you design a rule that doesn't pick what's necessarily best today, but enable companies to determine what's best going forward as well? So as you said, they've picked OGI, or these cameras, as best system of emission reductions, but then let's jump to these tables or these matrices that they've proposed. They've put into the proposal the idea that you could pick what technology might make sense for your site, provided that the technology meets certain frequency and detection thresholds.

Dan, do you think that helps lead to greater emission reductions, or has the potential, recognizing this is still a proposal, so EPA is asking for feedback, but is there a potential

that if companies start to use these technologies, we could get greater emission reductions in the end?

Dan: Yes. I think Kyle hinted at something, so I'll make it explicit, which is what we've seen in studies is that the areas that are being observed by optical gas imaging on kind of the classic survey tend to be focused on things that start emitting kind of small, medium level, and they're there for a long time, but what we know from field studies is that a large part of the emissions we see from aerial surveys or from larger quantity surveys are these intermittent large emitters. Some people call them super emitters, I don't like that term, but they're large emitters, and they tend to pop up kind of stochastically all over the place.

So underlying the proposal from the EPA, I think, is a real focus on that type of emitter, and what we know from certain basins is that may constitute more than half of the emissions in the basin. In other cases, it may not be quite as outstanding a quantity, but the idea is just having this frequency concept in the sampling is enough to pull in these additional emitters. That's not the only aspect of their proposal that's focused in that space, but that matrix really is focused on more frequent, more likely to catch large emitters.

Carrie: One thing I really like about the matrix, and Kyle, I know this jumps a little bit legal, but is that the EPA, when they're setting best system of emission reduction, has to determine whether the technology's available, and cost is part of that calculation. So that's part of why they're picking OGI as the best system of emission reduction, but the matrix allows companies to therefore determine what's most cost effective for them. So as they are thinking about their operation, does it make sense to do aerial surveys? What's the environmental conditions for that? What's the cost for that? Curious what you think about that, but I think it's interesting that it's allowing operators to determine the cost effectiveness for these technologies.

Kyle: Yeah, I think that's a really important point. There's certainly a variety of ownership structures out there, and for a company that's fairly small or only owns a couple wells, for instance, the use of an OGI camera for quarterly inspections may be the most cost effective, and EPA has to come up with something that's broadly applicable, but you're right on the money here.

For other companies that may own many wells within a particular basin, it could be far more cost effective to fly an aerial survey over that area, and so that's both cost effective, and for all the reasons that Dan said, possibly more environmentally effective as well, because they're going to be more likely to catch these episodic, stochastic types of emission events that may occur in between what would otherwise be a quarterly camera exercise.

So it is, I think, nicely responsive to the different situations that companies are in, and then when more companies are using those sort of advanced technologies, they're, by their use and by purchasing them, reducing their costs for everybody. There is the scaling effect that just comes with more people using these advanced technologies, and then you'd hope that in some period of time, even the smaller operators find that that's a cost effective route to go.

Carrie: The other thing we haven't talked about is this applies for new sources in the first instance, but this is the first time it will eventually also apply to existing sources. So the cost calculation, I think, could really change as people are looking at their full operation, not just in new sources.

Kyle: That's a really good point, particularly if you're an operator with a lot of operations. A new operation is a one thing here and maybe a one thing there, and the economies of scale are different than if you've got many existing facilities in a particular area, then the scaling really does become very real.

Dan: So if I can interject something else, I think that part of what's interesting or impressive about the proposal right now is that there's sort of a convergence between many different forces. It's not like companies are saying, "There's no way we want to do this stuff," and EPA is saying, "You must do this stuff." This is actually being driven from industry as well, and part of that is because the site designs people are now implementing are more amenable to this type of monitoring, and so there's a convergence between what's being constructed in the field and the capabilities of these new methods. So that combination is likely to make them even more cost effective, because they're tuning the sites for the type of emissions detection that the emission detectors can do.

Kyle: Carrie, if I can build on Dan's point, which is a very good one, it's not only just the sort of basic cost structure that's creating sort of a remarkable interest among companies in doing these things. When we're talking about fugitive methane, another way to refer to that is otherwise sellable natural gas. This is stuff that is the product they want to sell that's coming out of their system in this unintended, undesirable way. The savings of sellable product is a good outcome here. That's always been true, but even more of what's happening now is that a number of these companies have a range of motivations to be quite progressive on methane control beyond just saved gas.

A number of companies are facing expectations by their shareholders within the sort of environment, social, governance, ESG rubric to be addressing their methane emissions, because none of these companies sell to buyers that face the same sort of pressures. The buyers are putting pressure on them to show that they are lowering the sort of methane intensity of the gas that they're selling. So that includes certainly European buyers. There are many US utilities that are putting a lot of pressure on the sort of upstream oil and gas industry to do things about their methane.

So a situation that even five years ago would've really looked different where companies would be maybe more resisting anything that seems like a sort of costly extra environmental regulation, there's now sort of an alignment of interests here, and it certainly helps that while all this has been going on, there have been these very substantial advances in these technologies that have made them more effective, less costly, and very promising. So there's a tide to ride here with the right rule structure.

Carrie: Yeah, those are great points. I think one thing that we do at EELP is try to think through, what do agencies need to have a robust regulatory record so that these rules are durable, but also implementable? I'm curious what you both think are key issues for stakeholders to be commenting on to EPA in the comment period, which is mid-February or so.

Kyle: The key thing here that we're talking about is this matrix, in which EPA has said, "Well, we have our best system of emission reduction, which is a technology, OGI cameras, and a work practice, which is some frequency of monitoring, depending on the sort of size and complexity of your source." So that's essentially column A, and then what we have is that they've done their best using a model called the feast model to say, "Well, for things like aerial surveys or satellites or continuous monitors, we think if you use that sort of technology with this sort of frequency and can show it detects at this level, we'll consider that equivalent, and you can use that instead of this."

So EPA is welcoming comments on that matrix and the sort of modeling that went behind it and whether there's more data that they should consider and whether those are the right parameters and metrics. EPA, Carrie, as you well know, to have a final rule that stands up to legal scrutiny, one of the things that they have to demonstrate is that they have this sort of robust record to support these sort of technical determinations. If they're going to say, "Yes, we'll consider X equivalent to Y," they're going to have to have good data to support that. They've put a lot of data in this supplemental proposal, and it'll be important for people to comment on that.

Carrie: Yeah. Dan, do you want to talk about the emissions data?

Dan: Yeah, I would say there's probably two important things to respond on. The first one is operators need to look at what's in the table and say, "What would motivate me to do the right thing?", and I think that's looking at the internal implications of those rules and how that's going to be seen in the C-suite of the company, and to comment on that. I think it's important for them to come back and say, "Well, we need this adjusted to make it motivating."

The second thing is I think there's a need for the expertise in the field to come back and say, "You need to tune this in some way," that there's some issues with this, and I think we've probably identified in our conversations a couple of issues or a couple of areas that might have an impact on what's actually in the matrix. The matrix is good, it may

need a little tuning in spots, and I think preliminary alignment, those two comments are quite well aligned. What would motivate is well aligned with maybe some different ways of looking at the incoming emissions data.

Carrie: Yeah, that's really helpful, and I think EPA, to state the obvious, wants that feedback. They do put a proposal out for stakeholder feedback. I think it's interesting here. They've done two proposals, the first one in November 2021 and the second in this past November, so that they can keep getting feedback and make a rule and stick, and it's clear from the two proposals they listened a lot to what people wanted, to know that these technologies are improving and how do they design a regulation that doesn't constrain the technology, but rather allows companies to keep evolving.

There's two other parts of this rule that I think are important to tee up. One, just briefly, the super emitter program and what EPA has teed up there. Kyle, I don't know if you want to talk a little bit about what that is and what questions they're asking for feedback on.

Kyle: Sure. This is a very interesting innovation in this proposal that I expect that will get a good bit of comment. There are a couple issues I think EPA is responding to with this program, and then I'll describe what it is. First and foremost is that, as Dan pointed out, there is this sort of species of emission events that sort of contribute largely to the whole problem, which is these very giant emission events that can go on for a while, a big upset, and that when you sort of look at the whole scene of methane emissions, these big events count for a lot, and at the same time, you have certainly operator-led programs to keep surveying to spot those sort of events, but you also have some organizations that are looking to develop their own monitoring and surveying programs, non-governmental organizations.

So I can think of at least one example where an NGO is launching a satellite that could provide this sort of surveying. So EPA, facing a situation where these different wells and operations, they're sprinkled throughout a large area of the United States, they're very dispersed, they're in sort of empty areas, and it's difficult for the EPA as an enforcement body to do its own sort of verification and enforcement of what's being reported from the operators.

So they are looking to take advantage of these third party surveying opportunities by setting up a program where it would approve individually an organization that has the expertise and the technology to provide this sort of third party ongoing review and verification, and allow that organization, once accredited to do so, to report super emitter events, which it's defined, I think, as a hundred kilograms per hour type of event, and immediately issue a report to the operator, which is the origin of this event, as well as the EPA, and as relevant, if it's an existing facility, the state regulating agency, and make a public notice of it as well. Without any further action, the notice would trigger an obligation for the operator to take responsive action in some defined time

period. So it's a way for the EPA to spread its resources for verification and enforcement by taking advantage of expert organizations with approved technologies.

Carrie: Dan, why does this happen? How frequently is it? Are they big, or is it leading to a lot of emissions?

Dan: So I think that the threshold they set, it would be in line with some kind of process upset. Most sectors would reach that sort of size. You also will pick up some maintenance events, where people are blowing down equipment or doing something that's already known as well. So you can think of many different examples of why an emitter that size would occur, ranging from an equipment blowdown to a flare that's out that's burning a lot of gas in an associated gas basin, to potentially failure of some major component like a dump valve or some type of control equipment. Not all of them are abnormal process conditions or fugitives, but there is some strong evidence today that there are a set of intermittent performance problems that do cause those emitters.

Carrie: The other piece that I think is important that we can end on is how this rule interacts with other federal programs. So on other episodes of Clean Law, we've discussed the Inflation Reduction Act, which Congress passed this past summer, and one part of the legislation there is the methane waste charge. So Kyle, do you want to explain a little bit about how that works with EPA's regulation and the two programs together? Because the timing's a little tricky.

Kyle: The timing is a little tricky. So first, just a refresher on the waste methane charge. What we're talking about here in the Inflation Reduction Act is it identifies several classes of facilities in the oil and gas sector, and it basically says that in any year, and this is starting in 2024, where the methane intensity of the facility exceeds a certain amount, then it will have to pay a charge for each ton over the limit, and methane intensity here is generally measured as the methane emissions measured over the year, in some way, relative to the amount of gas throughput for the facility. So a big facility could have slightly higher excess methane emissions, a small facility, smaller amount.

Now, what's important to understand about the methane charge is that there are some statutory exemptions from the charge. The basic structure is that if the facility is subject to the EPA methane regulation, they can be exempt from the fee structure, but there's some really important conditions on that. First, there must be a determination that the final EPA methane rules are at least as stringent as what they proposed originally back in November 2021. So EPA is actually soliciting comment in this supplemental proposal, like "How would we calculate that?" I sort of feel comfortable saying that they're going to find one way or another that it's more stringent than what they proposed earlier, I think it is, but that's one issue. It has to be more stringent than the November 2021 proposal, and I think what was going on there was that Congress was creating a backstop here, that EPA is just going to have to finalize something that's real before we give them an ability to exempt facilities from the methane fee.

The next big one, though, is that for facilities exempted from the rule, that the state plans, under the EPA rule, must be in effect in all states with applicable facilities. That's a big issue here, and it goes to what you were pointing out, Carrie, about the timing mismatch. EPA has already made clear it's proposing that state plans wouldn't even be due until sometime in 2025, but the fee applies starting in 2024. So it looks like, one way or another, we're going to have a year of this methane charge on facilities that have high excess methane intensity. Not clear yet how EPA will calculate that. That's occurring in another rule setting, what methane intensity is.

I think it's also worth pointing out that for this exemption, it's only for the facilities actually subject to the EPA rule, but there are facilities called out for the methane fee classes of facilities that are not subject to the EPA rule. One example is like LNG terminals. So even when this exemption kicks in, it won't be available to everybody, and so those other facilities will have to be taking steps to ensure that their methane intensity is below the statutory thresholds.

Carrie: It's also all states. If one state decides not to submit a plan, that affects everyone else that has submitted a plan. So there's a lot of potential to have industry and the regulated entities wanting their states to submit plans, which I think is a really interesting dynamic, and then what we saw in the Trump administration when they rolled back the Obama administration's rule, this, I think, also creates pressure so that industry wants this rule to stay, as opposed to being rolled back so that they don't end up paying a fee if you were to have something less than what's proposed, as you mentioned from the November proposal.

Kyle: Absolutely.

Carrie: Dan, Kyle just mentioned Subpart W, EPA's obligation to figure out emissions and improve its emissions profile. Could you talk a little bit about how they're trying to get closer to empirical data as a result of the IRA and the regulatory efforts?

Dan: Yeah, I think the key thing you see with emissions reporting is that if you don't allow people to report measured emissions on stuff, whatever that stuff is, then the only way they can change their emissions is to change the number of things they have in that bag of stuff. So if you are only using emission factors times some count of equipment, the only knob is to change the count of equipment. That's not a knob that has a lot of dynamic range. You can't move it very far.

So I think a key thing that's happening as part of this discussion now is the idea that people can replace emission factors with measurements, which allows them to differentiate their facilities at different scales by going after certain emission sources that might be easier for them to go after, and to do nothing, I guess, on other sources that might be lower down on the priority list, and I also think the other big plus of that approach is that it does encourage people to develop sites that have lower emission

profiles overall, so that they're revving their sites in a less emissions intensive fashion all the time.

Carrie: Well, I feel like we could talk about these aspects for a long time. I think we should stop there, but I really appreciate you both taking the time today to speak about this and for being on CleanLaw, and I look forward to continuing these conversations with you both.

Dan: Thank you.

Kyle: Thank you. Always learn a lot from talking with both of you.

Carrie: Same. Thanks.

Dan: Yeah, it's good to hear Kyle describe the guts of these different legal structures, because that's not something I work on day-to-day.

Kyle: I'm always pleased to provide my history major expertise to the emissions technology to support you, Dan.

Dan: Sounds good.

Carrie: Thank you guys.

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