



CleanLaw 65

Jody Freeman and Chet France Discuss the Clean Car Rules – January 28, 2022

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Hannah Perls: Welcome to CleanLaw, from the Environmental and Energy Law Program at Harvard Law School. In this episode, our founding director, Jody Freeman speaks with Chet France, who served as a senior executive at EPA and led the development of vehicle pollution standards at the agency, including overseeing, during the Obama administration, the first national greenhouse gas standards for cars and trucks in US history. They talk about the development of the clean car rules, the stalled progress under the Trump administration, and the Biden administration's renewal and strengthening of the original standards. With president Biden's ambitious goals for electric vehicles, the major auto companies pledges to produce an all-electric fleet, Congress's funding of charging infrastructure, and the new EPA standards, Jody and Chet discuss how we are at a potentially transformational moment in the history of the Clean Air Act, the auto industry and climate change. We hope you enjoy this podcast.

Jody Freeman: Welcome to CleanLaw. Chet, it's great to have you with us. It's wonderful to talk to you again. I miss talking to you all the time about cars and standards. So today we will do a detailed, deep dive on the new EPA car rules, regulating greenhouse gas emissions. But first, let me just welcome you to CleanLaw.

Chet France: Well, thank you, Jody. I really appreciate the opportunity to talk to you. It's been a long time. I'm looking forward to our discussion.

Jody: Before we get started on the rules that EPA has put out, let me ask you to give us a bit of background on your career. You spent a long time at the Environmental Protection Agency in the Office of Transportation and Air Quality. Not a lot of people know about that office. You became its director. And can you tell us a little bit about your time at the agency, your career and how you came to play this really important role in a number of very important regulations that came out of the EPA?

Chet: Oh, absolutely, Jody. I actually started working for EPA back in the mid-early-'70s, 1973 to be exact. I was fresh out of undergraduate school. I had a lot of job offers, but the EPA offer seemed very exciting and most importantly, an opportunity to make a difference, and hopefully I have. I started working in EPA's national laboratory in Ann Arbor, Michigan. They have a large facility there right across the street from the University of Michigan, that does research in engineering and



economic analysis and modeling to support regulation and certifying manufacturers' products prior to sale.

Chet: I started my career in regulation development and in fact spent my whole career developing regulations and standards, and eventually became a senior executive in charge of regulation and standards development. I spent my whole career there until I retired in 2012. I had the great opportunity to work on hundreds of regulations, all of them affecting mobile sources, such as cars, trucks, ships, and the fuels they use. So it was a very exciting career and hopefully, I made a difference. Others will make that judgment.

Jody: Well, I'm certain you made a difference. And I know that from personal experience, which brings up how you and I know each other, which is from the Obama administration, which seems like a million years ago, but really was not that long ago. You and I got a chance to work together on what were the first greenhouse gas standards for cars and light-duty trucks under the Clean Air Act ever in the United States, the first federal GHG standards. And it was quite a monumental rulemaking, and we had a chance to work together. I was in the White House, helping to coordinate climate energy policy for President Obama, and you were in charge of the Office of Transportation and Air Quality. I remember those days as incredibly challenging, incredibly interesting, and we managed to produce a really powerful, important first step in setting standards for the industry. And I raise it first of all, to say that, Chet, working with you made a really important mark on me.

Jody: When we hear about civil servants, career staff at agencies, and we hear them maligned, and we hear criticisms of government, I always think of the counter example, the paradigmatic civil servant, who works so hard on behalf of the American people to do good things and to fulfill the mission of the agencies they work for, and the person I think of Chet, is you. So you were just magnificent when we were in that complicated rulemaking process. So this is my opportunity to publicly mention that. It was a real pleasure.

Chet: Well, you're embarrassing me, Jody, and thank you so much for the kind words. I had a team, about 100 engineers, scientists and economists behind me that did a lot of the work, but I really consider that rule as probably the most important effort that I ever worked on in my career. And I worked on a lot of important things, but that particular rule while very, very difficult in terms of getting it formulated and promulgated really has put the agency, at least as it relates to mobile sources, on a different trajectory around climate. So I think that was probably one of the most important things that EPA has done in its history on mobile source controls.



Jody: So we want to give people a sense of the importance of the Biden administration's new rules for cars and light-duty trucks, controlling their GHG emissions, why it's important for climate policy. There's a long history to how these rules came about and we want to give people a sense of how the Obama team set these standards back in 2009-'10. The Trump administration actually weakened them and rolled them back in their own version of this rule. And now the Biden administration is coming in to strengthen them again. So there's been this dynamic of Obama, Trump, Biden, as there is in many policy areas. And Chet to set the stage, can I just give you a chance to give your reflection on sort of what essentially has happened between the Trump administration leaving office and the Biden team coming in to reset these standards?

Chet: I can't respond that until I put in context really what the Trump administration did. The greenhouse gas rules that EPA put in place, put the auto manufacturers, and automobiles in particular, on a trajectory to reduce CO2 emissions through 2025. And very unfortunate that the four years of the Trump administration basically were focused on really peeling back those regulations and in fact, they did. And one of the most important things I think out of the box that the Biden administration has done is to get back on that trajectory and in fact, they did that. I think they took longer than I would've hoped, but I always set ambitious goals. And in fact, they ended up in the out years strengthening it. So I think they did the right thing and they did it in a way that I think gets the country back on the right trajectory for transportation.

Jody: Just to give people sort of a sense of what this means more concretely, so in the Obama years, the EPA standards basically put the auto industry on a path to improve the fuel efficiency of cars and to reduce the greenhouse gas emissions from cars, I think this is fairly accurate, Chet, say 5% a year, to improve about 5% a year, which was much better than in the past. And what the Trump administration did was come in and freeze that, so the improvement would be almost nothing instead of the 5% a year. And it becomes particularly important for, as you said, Chet, the out years, the later years, 2025, 2026, 2027 and beyond, because that's where if you're improving year over year, you start to really begin to reduce the greenhouse gas emissions, which drives electrification over time because the standards just get more and more stringent. So the Trump administration essentially froze them in place. And that's what we're talking about now, when we talk about the new rules, where Biden has come in and directed the EPA to take a new look at them.

Jody: So just one further bit of background to clarify for folks the role that EPA plays versus the role that NHTSA plays, the National Highway Traffic Safety Administration. They have two separate roles in regulating cars and mobile sources. EPA regulates cars and trucks for their pollution. EPA is the pollution regulator, and greenhouse gases have been a pollutant under the Clean Air Act



ever since the Supreme Court in Massachusetts versus EPA, the famous case from 2007, ever since the Supreme Court acknowledged that greenhouse gases are pollution too, so EPA can regulate them just like they do other pollution.

Jody: Meanwhile, NHTSA has always regulated fuel efficiency, that is the miles per gallon that people see at the pump. So we have two agencies doing two different things. One is EPA regulating greenhouse gases as pollution and the other is NHTSA regulating the fuel efficiency, how far a car goes basically on each gallon of gas. And so these rules that we're going to talk about essentially need to be issued by both agencies because they're each doing something separate. Have I basically got that right, Chet?

Chet: Yes, you do. I really want to stress that EPA, that the underlying statutes are different and a lot of the constraints and restrictions that exist in the NHTSA fuel economy statute are different than the Clean Air Act. So while the programs in the past have tried to be aligned, they are different fundamentally, and a lot of it being driven by the fact that EPA is regulating CO2 and they're working under the Clean Air Act as the underlying authority.

Jody: And the other thing to appreciate here is that if you think of these, I call them casually the car standards, so forgive me if that's how I talk about them for the next little while, the car standards are really important because the transportation sector in the United States is responsible for nearly 30% of US greenhouse gas emissions. So this is a very big share of the country's emissions. And the light-duty vehicles that are being regulated with these standards, that is the passenger cars and light-duty trucks that we all drive, those are 58% of that 29%. So this is just by way of saying transportation is a big proportion of our greenhouse gas problem, and so going after the emissions from this sector, going after them and trying to control them is really important as a matter of climate policy.

Jody: And Chet, correct me if I'm wrong, but it's really the most important policy in the transportation sector because oil is the product that we use to fuel our vehicle fleet, gasoline from oil, and we don't have replacement fuels in the way that in the electricity sector for power, we could substitute renewable wind and solar for let's say coal. So it's harder to come up with policy fixes right now to replace oil in the transport sector, which is why standards for the cars that use refined oil is so important. Am I getting that basically correct?

Chet: Yes, Jody, and I would also just to go back a little bit is transportation, while 30% is this largest single source of CO2 emissions in the US, so if we're going to seriously address climate emissions, transportation has to be part of the solution. And I would also say on internal combustion engines fueled by petroleum, don't get me wrong, I mean, they've made a lot of progress in terms of improving



efficiency and lowering CO2 emissions, but they're almost at the end of the road. The opportunities for additional reductions using conventional liquid fuels, we've almost reached the limit. So something has to change fundamentally within the transportation sector, which really is in large part, driving the focus on electrification.

Jody: Right. And so we're in a new era now. Electrification is all the rage. The auto industry has pledged to transition to electric vehicles, to zero emission vehicles. We've seen companies like GM announce their aspirations for producing 40 to 50% of all the vehicles sold in 2030 to be zero emission vehicles. I think the industry has made billions of dollars of investments, Chet, right? I think we've talked about this before. I think it's something like \$330 billion by 2025 will have been invested by the industry in electrifying their fleets in new models. That'll be battery electric vehicles, zero emission vehicles. GM itself has talked about introducing 30 EV models by 2025 and to be all electric by 2035, and carbon neutral by 2040. This a lot of statistics and a lot of numbers, but what it suggests to you is the industry itself has made a lot of pledges and talked about their aspirations to be moving in the EV direction. Chet, how should we think about that, what the industry's done in this space, before we talk about the rules that EPA has put out?

Chet: Yeah, Jody, and if you could bear with me for a second, the numbers you've quoted, they're changing every other week. And the latest figure that I have is automakers will spend over \$360 billion prior to 2030. That has changed, and over \$72 billion on domestic manufacturing. This is unheard of. There's no historical precedence for this level of investment in such a short period of time.

Chet: Also, in terms of EV models, and again, this is changing daily, at latest count, there's currently 64 EV models in 2021. That's going to grow to 125 models by 2023. So we're witnessing in front of us a really dramatic revolution, and I'm not speaking in hyperbole. It's just there's no precedent for it within the history of the automobile. And so there's a lot of good news in terms of investments and things like that. And also, there's competitive issues involved too. Other countries like China and Europe are moving aggressively towards electrification. So part of this is out of self-interest too, but we are at a sort of an inflection point, I think in terms of a move towards electrification, which is really a silver bullet for addressing CO2 emissions from transportation.

Jody: And we can come back to what the industry is doing in terms of putting out EV models for some of their really kind of top brands. Ford's F-150 is the example that springs to mind, they're putting out an EV version. And the Mustang, and the Cadillac name is being attached to EV models. And we can come back to all that, but it does raise the question, well, if the industry's moving in this direction anyway and they're putting so many billions of dollars behind the transition, why



do we need the government to establish rules, regulating CO2 from cars at all? And that sends us into what these rules are really about, why they're important, and you need both the industry's pledges and investments, but also the underpinning of federal rules. Can you help us understand why we might need both together?

Chet: Absolutely. And I want to start off sort of with the end in mind, which is trying to get carbon neutrality in the 2040 to 2050 timeframe. And in order to do that, that really dictates being on a trajectory by 2030, 50 to 60% of new car sales being electrified, and 100% by 2035. So otherwise, there's no way of reaching carbon neutrality in the 2040, 2050 timeframe. And in order to do that, really there's got to be strong market signals sent to the automobile manufacturers. While they're investing heavily, there are no assurances, no guarantee that they're going to stay on that trajectory. That's why I used earlier, I described we're at an inflection point and I think government policies in terms of helping that build that momentum and keeping it on the right trajectory to achieve 100% by 2035, for example, but also standards.

Chet: EPA since the beginning of the Clean Air Act, has utilized standards as driving the development of technology. The thing that's different now is that the technology already exists. And if anything, it makes it easier for EPA to define that trajectory.

Chet: But I really feel that the standard setting authority that EPA has is absolutely one of the key tools that the administration has in terms of ensuring that this transition happens smoothly, it happens in a way that helps the auto industry be healthy and competitive and create good paying jobs in the United States.

Jody: So that brings us to the Biden administration's plan to put these standards in place and to do that really at the same time, as hoping the industry will continue down its path of investment. It's tried to get the support of the industry for these new standards.

Jody: President Biden signed an executive order, setting a goal that's now become very well known, which is 50% of new cars sold in 2030 should be zero emission vehicles. And the expectation now is that by 2026, EPA is predicting 17% of the market of new cars will be EVs.

Jody: And I just want you to help us understand this Chet, because I think right now in 2022, EV sales are what, I'm guessing a bit, but is it 4% of the market? So how are we going to get from 4% to the 2026 expectation of 17%, all the way to Biden's goal of 50% new cars sold in 2030? That sounds like a long way to go. It sounds like the standards will have a lot to do with getting us there.



Chet: Oh, absolutely. And like you said, it's around 4% now and is growing. During the pandemic, for example, traditional ICE overall car sales were down while electric vehicles were up. So there's a lot of good news in terms of growth. And like you said before, key manufacturers are introducing electrified models in some of their mainstream products, but there's no assurance in the current regulatory framework that they're going to reach 10% or 15% by 2026, say.

Chet: I know EPA projected in their final rule for 2023 to 2026 that restored the Obama standards, 17% ZEVs (zero emission vehicles), but that's a projection, Jody, you cannot take that to the bank. That depends on EPA projecting how the manufacturers will respond and forecasting the mix of technology. There's no assurance of that. And in fact, I'm personally doubtful absent a stronger signal beyond that, beyond 2026 for 2030 and beyond, I think that we should not count on 17%.

Chet: Could it happen? Absolutely. And then that looks like the trajectory they're on, but there's no guarantees. And in fact, if you bear with me for a second, I think history of regulations and opposition by the auto industry, which suggests that you can't count on it. And while we're in a much better place, I think the administration's in a much better place in terms of automobile investments and the trajectory they're on in terms of developing electrification, that is not typical and not characteristic of the history behind automobile regulation.

Chet: So I think we're at a unique position, the automobile companies are supporting figures like 50%, even GM, 100% aspirational target by 2035, essentially all the manufacturers have made strong commitments. And I think that will help EPA and the administration set really ambitious goals and they're absolutely necessary to ensure that it's going to happen.

Jody: So it sounds a lot like trust but verify that is, there is a long history of the auto industry, both the individual companies and their trade associations, opposing strong pollution regulation from EPA and in particular, they have pushed back against greenhouse gas regulation.

Jody: Certainly happy to go along to some extent with the Trump administration weakening the rules. So there's a sort of sense that the industry may be saying and doing all the right things, but the standards, government requirements to reduce CO2 for each model year improving year over year is really important as the baseline from which we start. Does that sound about right?

Chet: That sounds right. And I would be remiss here, Jody, if I didn't point out that when Trump came into office, one of the first things the automobile industry did within days of him taking office was request relaxations in the existing greenhouse gas standard.



- Chet: So we can't forget that. They're in a much better place now. And I think we should take some solace in that and I think build on that, but we also have to remember that this is a difficult landscape and to drive a change like we're seeing in the marketplace is challenging and it's going to require the manufacturers to be all in, it requires the administration to be all in, it requires EPA to be all in and use all the tools in the toolbox to make that happen. A standard being one of them, so was investments in infrastructure and things of the like.
- Jody: And we can talk a little about what Congress did in putting some dollars behind electrification in the infrastructure bill, but we'll get there in a moment. What I want to do is finally let's talk about the rules. EPA had proposed new standards last August, they finalized them just recently.
- Jody: And what these rules do is they set CO2 standards for the passenger fleet, light duty trucks and passenger cars starting with 2023, '24, '25 and '26. So they go out to 2026. They essentially restore the Obama era standards, meaning they just put us back where we were for the model years in the next couple of years, 2023, '24, but they increased the stringency for CO2 standards for these cars and trucks considerably more for '25 and '26.
- Jody: And that's the sort of striking thing about the rule. They're trying to really drive down emissions and Chet, can you put it in context for us, how stringent are they really for model years, 2025 and '26? What does this really mean for the auto industry when we say they have to comply with these rules, is that really hard to do? What are the compliance flexibilities that they get from the agency to make it easier to meet the standards? This is sort of the technical part of the podcast, but it's really important in understand what do these rules mean in practice?
- Chet: The unfortunate starting point for the regulations was that Trump had rolled back the standards to 2021 levels. By the time that the Biden administration came in office and is now putting in place corrective action, model year 2021 and 2022, they were lost. Those cars are on the road. So their rule can only affect 2023 and beyond just due to the realities of model year introductions, the timing of those introductions.
- Chet: And what they've done is started the program, and this is unprecedented, they have a program that starts in 2023, a very short lead time. They've included a number of flexibilities to help support the feasibility of that short lead time. And we can get into the complexities if you wish, but there's a lot of credits and other flexibilities that sort of smooth that big jump in stringency going from basically 2021 levels to 2023, which is almost a 10% increase in stringency.
- Chet: So double what was contemplated under the Obama standards. So I think in terms of getting the program up and back to where it was under the Obama



standards, I think EPA did a good job of threading the needle. What I think is particularly noteworthy is they went for 2026 and a little bit in 2025, they went beyond the Obama standards and they did it almost 10% increase, more stringent than the Obama standards.

Chet: I think everything they did there, that is the most noteworthy change. And the reason I say that is what they've done is helped improve the trajectory as they take on the next round of standards, looking at 2027 and beyond. And that's the next in line in what the executive order contemplates EPA doing over the next couple years. So I think that is of particular note and that will drive on the increment more electrification and is a much better stepping off point for the next rule.

Jody: So again, just to make sure people understand what this means concretely, these standards can be met, right? You can reduce the CO2 from cars and trucks now by making certain improvements to the traditional internal combustion engine. You don't need to build an EV right, to comply with the CO2 standards for the years that are the short years, the next couple of years of standards.

Jody: You can still build internal combustion engines and you can meet the standards, right? It's as they get more and more stringent as we get further and further out, and especially what we're anticipating EPA doing from 2027 and beyond, that's where it's likely very hard to meet those standards we expect with the internal combustion engine. That's when we will see a bigger shift to electric vehicles because only batteries right, will be able to achieve these reductions in CO2. Is that the right way to understand it?

Chet: That's exactly right, Jody. And by increasing the stringency in 2026, as EPA did in their final rule, it moves that point closer to sort of the, what I would call the sort of the cliff event, where they're close to setting a standard where the only way you can meet it is through electrification. That is really the crux of the next rule making that EPA has to undertake.

Jody: Now, when we get there, we'll talk about some of the challenges because we're in a bit of a race against time for the next round that you and I are talking about now, 2027 and beyond, EPA hasn't done that yet, right? This batch of standards stops in 2026.

Jody: So we're not there yet, but we would expect to see those come out of the administration before the end of Biden's first term. That's what has been established, we hope, by the executive order the president's signed, but there's no guarantee. There's a little bit of anxiety about how fast can they get the next round done.



Jody: And we can talk about that before we end the podcast, what are we worried about right, with the next batch, but with this final set of standards, what I want people to understand is, it's ambitious in the sense of being so close in time, right?

Jody: You mentioned that 2023, 2024, those cars they've been largely designed already, right? One of the things EPA has to do under the Clean Air Act when it sets these standards is take into account, not just technological feasibility, but lead time. And you'll be able to speak to this far better than Chet, but the challenge of setting standards for the passenger vehicle fleet is that the car companies are designing these cars years ahead.

Jody: So EPA can't just drop a standard on them and say, hey, by 2023 you have to meet this because those cars are already being designed and maybe even in production, right? So lead time, technological feasibility, these are all built into the law as things EPA has to consider. Am I capturing it?

Chet: Absolutely. And of course the amount of lead time is a function of how big are the technological changes, but you're absolutely right, Jody, in terms of the rule that we're currently talking about. The reality is a lot of the vehicles that are even two years out, their designs are pretty much finalized.

Chet: Now manufacturers can make adjustments to calibrations and things like that, but the hardware is in place. It is near impossible to make any substantive changes at that point. So that was one of the big challenges that EPA had to face. They had more flexibility when you get out in model year 2025 and 2026. And of course that's where they made some important changes. And I think that reflects the reality of the manufacturers have more lead time to make those bigger jumps in stringency.

Jody: So, critics of government standards, government regulation often say, well, agencies don't know anything about the industries they're regulating. They don't have the same information. How can they project what the businesses can do? How do they know that the car companies can meet these standards? And you and I spent a lot of time back in the Obama days when we were working on the first round of this, talking about the modeling that agencies do, the projecting, the estimating, the modeling they do to support what they say is achievable.

Jody: And it involves knowing what technology is out there, knowing the cost of that technology, knowing what the industry is already doing and has already demonstrated. This may be the part of the podcast that people fast forward through, but to me it's really important to understand how does EPA go about even doing the technical work to say, yes, we know you can meet these standards and still build a car that is a good car people want to buy, that will be something



you want to design, that fits within the kind of range of things that these companies want to put out, how do you know what they're capable of achieving?

Chet: You said, folks might want to fast forward through this, they might want to really listen to this because I think this is sort of the inside baseball question. I will first start off saying that the group of people that are doing this had worked for me, like I said earlier, close to 100 people, engineers and scientists, they are some of the very best people in the country on automotive technology.

Chet: And in fact, while I was there and the team is still intact, our engineers that had lead responsibilities for product development within the auto companies, there were folks that worked for Ford, Chrysler, General Motors that EPA was able to attract and hire. So I first want to start off is that the level of expertise of the staff is absolutely unmatched. And I'd also say that the other tools that EPA has is their laboratory in Ann Arbor.

Chet: They do really fundamental research and they're able to evaluate technology and develop technologies, whether it's after treatment, whether it's engine technologies, things like that. So there's a substantial amount of real world testing that goes on in that laboratory. And last but not least, the EPA team has access to business confidential information from all the manufacturers.

Chet: And I know Jody, you probably remember this when we were working on the greenhouse gas rule, we had access to future product plans that reached out four or five years. And I don't think there's any group within government or within the country that has access to that level of detail of information.

Chet: So I'll point out that in the EPA's history and like I said earlier in the podcast, there's hundreds of rules that EPA worked on. EPA has always prevailed in terms of any litigation associated with feasibility. So they have a really proven track record in terms of being able to do this correctly.

Jody: What's interesting and I can attest to this because I visited that car lab and was given the tour and it's so impressive what you all were doing there and the expertise as you say, Chet, the other thing I think I came to appreciate working on this was the model that EPA builds is really a real-life reflection of the technologies that are actually available in the world, that the companies are actually using their real-life estimates of costs based on not some fantasy of what technology costs, but what technology actually costs now in the real world. EPA makes projections about how technology will develop over time that I think you will say to me is proven very realistic, that the projections, if anything, have under anticipated how fast technology has evolved. And so, the modeling capability of the agency is also something I think that's quite special, that has shown itself to be reliable in the past. Is that a fair assessment of how you model?



Chet: Absolutely. And one of the last things that I had my staff work on before I retired from EPA, we did a retrospective analysis of regulations in terms of what the agency forecasted versus what actually happened in the marketplace. And, in every instance, EPA's estimates, while viewed as aggressive at the time, ended up being pessimistic. The regulated industry and the automobile companies, in particular, did much better than EPA projected. And I think that speaks to the marketplace. It speaks to competitive forces. It speaks to the ingenuity that auto companies can bring to bear once they have those standards put in place and have a motivation to reduce cost. So your summary is absolutely spot on, Jody.

Jody: It also goes, doesn't it, Chet, to the legal defensibility of these rules. Because every major EPA regulation under the Clean Air Act, we can expect to be litigated, to be challenged. In our time, in the Obama years, we had an agreement. We managed to negotiate an agreement under which the auto industry actually agreed to support the regulations because they felt that their views had been heard, they were considered very seriously when we designed those rules. And so, in a very unusual moment, they chose not to challenge the rules and they agreed to support them. I'm not sure we can expect that going forward. It's unclear, but I think we have to be ready for litigation challenging these rules.

Jody: And this technical underpinning, the solidity of this expert work is going to be very important because the record will be subject to arbitrary or capricious review, that's the administrative law test that courts will use when they evaluate these records. They're looking for whether there's evidence of arbitrary or capriciousness. And the task for the agency is to build a really legally solid technical foundation where if you probe it and you press it what you find is, if anything, an excess of caution, and care, and extreme rationality.

Jody: So, Chet, can you give us a sense of the components of this rule-making that you think are really reliable and a sense of why you would have faith that it's likely to stand up in litigation?

Chet: Well, first of all, EPA, if you look carefully at their feasibility analysis and the analytics that support it, it is really, really grounded in fact. To the point where if you carefully look at the analytics, and I don't want to get in and bore the listeners, but they actually do a manufacturer-specific analysis, reflecting where each manufacturer's capabilities are and have demonstrated that it is broadly feasible.

Chet: That being said, as you pointed out, the landscape is different going forward. In two major ways, one, there's a lot of competitive implications going forward, especially as the industry transitions to electrification. There'll be winners and losers, as there always are in free markets. The other thing, too, is there's a certain amount of politicization that has occurred around the greenhouse gas



standards and electrification in general, and that's unfortunate. In the past, EPA was fortunate to be able to really keep this in the technical arena. So I think your observations, Jody, are really, really appropriate in one where, if anything, I think the EPA has got to be doing even a better job than they have done in the past, because there are going to be outside interests that want to challenge EPA's findings.

Jody: We're also in a different context now, politically, and in terms of the composition of the courts, generally. But, in particular, the Supreme Court, we just saw recently the Supreme Court blocked, they issued a stay for the Biden administration's vaccine mandate that came out of OSHA, the Occupational Safety and Health Administration. That law gave OSHA very broad, extensive powers to protect workers in the workplace from workplace dangers, including from, quote, new hazards. So this was a law that was, if anything, very broad in the power it gave to the agency. And yet, the court determined that the agency had overread its mandate.

Jody: And so, this is a real shot across the bow from the Supreme Court. And I think there's anxiety for understandable reasons about environmental rules that depend on reading the statutory authority like the Clean Air Act. And I think, here, the standards that EPA has put out really depend on a straightforward reading of the statute. There's nothing unusual about it. The agency has the authority to set standards for mobile sources, for new cars and trucks. They have to take into account the things you and I have been talking about, Chet, technological feasibility, lead time, et cetera. There are certain factors that need to be considered under the law.

Jody: But EPA is in the middle of the fairway with this rule and I think has worked hard to make sure that everything it's done is based on a strong foundation of textual authority. And that the record for the standards, as we were just saying, is really robust. So this is the challenge of being a federal agency at the moment, in the face of a very skeptical judiciary and a very, very skeptical Supreme Court, when it comes to the exercise of federal regulatory power. That larger context is just really important to keep in mind, I think. It's different than we were there, right? The Supreme Court was composed a little bit differently when we were there.

Chet: No, absolutely. I think the landscape is quite a bit more, complex may not be the right word, but more challenging. I just think it just raises the bar a little bit in that the regulators, in particular, have to be more cognizant of the threats that are potentially out there. But I think they're up to it.

Jody: And, in fact, EPA's mandate, of course, under the Clean Air Act, is to protect public health and welfare. And so, even though it has to take into account feasibility, and lead time, and cost, et cetera, the overwhelming job that it has,



the mission it has, is to protect public health and welfare. And these CO2 standards that get increasingly stringent over these model years, they are focused on reducing greenhouse gas emissions. And there's other conventional pollution that gets cut along with them, right? So there are public health benefits from that whole suite of emissions reduction.

Jody: So here are just some of the things EPA said about these standards, just so folks know, that they're expected to result in 28% reduction in greenhouse gas emissions over four years, as compared to 6% under the Trump-era standards, over the same time period. And EPA projects these standards will reduce GHG emissions by 3.1 billion tons by 2050, which is a big jump over even what they had proposed in August. The final rule is 50% more reductions of greenhouse gases than what they had proposed in August, and they're also going to reduce emissions of conventional pollution and air toxics. So there are massive public health benefits to these stricter standards for the passenger fleet.

Jody: And then, Chet, I was going to ask you to reflect a little bit on the other benefits, like reducing fuel consumption that saves consumer's money at the pump. Because more efficient cars means you will have to use less gasoline, which saves drivers' money over the lifetime of the car, but, at the same time, there might be some additional upfront cost you have to pay to buy the car. How do we think about all of this, the impact on consumers and whether there's a real benefit for consumers with standards like these?

Chet: There's a number of factors. First of all, this is really a value proposition for consumers. Like you said, while there's a slight increase in first cost, the fuel savings far outweigh that first cost, so, in a really dramatic way. And, of course, as you move towards electrification, for example, the net savings could be on the order of \$8,000 over the life of the vehicle. So we're talking real money here for consumers, which I think is driving the interest in these sorts of technologies.

Chet: The other thing I want to point out is a lot of our focus today, Jody, has been around CO2, appropriately, and, of course, there's benefits associated with reducing CO2 that are really significant. But, as you mentioned, the criteria emission reductions are critically important, too. And the current inventory, current burden on our cities, in terms of poor air quality, there's about 20,000 premature mortalities associated with transportation emissions. So these are directionally going to help the health of Americans and, in particular, those that are located in disadvantaged communities. So while we're talking about CO2, we can't forget that this is a multi-pollutant program and produces benefits across the board.

Jody: Right. You mentioned criteria pollutants, which is just the inside-baseball term we use for the conventional pollution that comes out of the tailpipe of cars like



carbon monoxide and the other pollution that contributes to ground-level smog when sunlight interacts with it, and all those co-pollutants are reduced along with CO₂.

Jody: Mentioning all this, because as you said, Chet, there are tremendous public health benefits to these rules, and there was a lot of focus in the development of these rules on environmental justice, on the benefits, in particular, for low-income communities exposed to a lot of these emissions that come from cars and trucks because of where they're located. And it was striking how much effort the agency put into showing what the net benefits were, especially for these communities and also what the cost might be in terms of what they face buying new cars and used cars. So the agency took seriously all of these impacts in their cost-benefit analysis.

Jody: The other thing I wanted to ask you about is the rationale for stricter standards over time, that is what's really behind this? The agency seems to think that battery costs are dropping significantly more than even they had anticipated six months ago, and they were updating their expectation of battery cost dropping. And that's a big part of why the rule can get stricter over time.

Jody: And what's underneath that, Chet, I just wanted to ask you whether you think it's realistic about battery cost dropping. Why is this going to be achievable? EPA seems to think in these rules that there will be tremendous health benefits, that will be affordable for the car companies, in part, because battery costs are dropping so significantly.

Chet: Yeah, absolutely. And it seems like every projections that are a year old are out-of-date now. There's a number of data points that we could focus on. One is you could start looking at the price point of some of these vehicles that are being... like the Lightning, and the new Chevy Silverado, and other vehicles out there. Okay? They're cost-competitive with their ICE counterparts.

Chet: The other thing that's really important, that's really driving down the cost, like you said, is battery. But they're bringing to bear mass production effects in addition to the formulation of, for example, batteries and reducing the cost through design. But there's also another thing at play in terms that as these come to scale, and it's a well-known effect, we see it across consumer products where prices fall over time. And we're seeing that. We're in the middle of that. And it's just not only batteries. It's also the electric motors that are on these vehicles. And it's also the power electronics, like inverters, and things like that. Those are all coming down and it's because of the ability of auto makers to start mass-producing these components that, really, will start driving down the cost.



Chet: And the last thing I'd like to say, Jody, it's just not you and me saying this, it is the CEOs of Ford and General Motors that are forecasting cost parity in mid-this decade. So it's a lot of points of reference that I think that we can point to that really support what you just said, Jody.

Jody: And it sounds like the two things that consumers often say, the most common things they often say are slowly being addressed. So the first thing I often hear people say is that, "Look, these electric vehicles, they're just going to cost too much upfront. And even if you tell me it'll pay for itself over time in saved fuel costs, even though I'm going to save money at the pump over time, I just can't pay the money up front." It sounds like we're entering an era where there may be parity. In other words, it may not be that much more expensive, if at all, to buy the new cars. And so, they'll be much more competitive than they've been historically.

Jody: It also sounds like the other worry consumers often have, which is something called range anxiety, that they're worried that the cars won't go far enough without needing to be recharged. Sounds like being worried about range may also be addressed by better, longer-lasting batteries, and perhaps by more charging infrastructure across the country in more places that reassure people that, "Yes, they can charge their cars when they need to charge their cars." Do you think it's realistic, in particular, that charging infrastructure will develop over time and that both these concerns will be addressed?

Chet: I'm going to give you a really, I think, accurate, but some may view optimistic, view, but it's based upon a career's worth of experience on these issues in terms of projecting what's going to happen.

Chet: And I think we're seeing this play out in real time. I just read recently that the new Chevrolet Silverado has a range of 400 miles, and other vehicles have longer range. Range is getting longer. There's nothing mysterious about it. It has to do with how big of a battery do you want to put on the vehicle. And, of course, that translates into increased cost. But battery costs are coming down. Battery formulations are changing. They're looking at different chemistries, which create the opportunity for what I would call power density. Getting more power in a smaller volume, which can help keep the cost down, prevent having to use a lot of real estate to put the batteries, and helps extend range. I think we'll see this sorted out in a way that I think consumers will be satisfied. And in large part, this is going to be driven by what consumers want. I don't think there's anything technologically infeasible about providing range. It's going to be a question of how much you're going to want to pay for it. And the other component here, Jody, as you really, really pointed out is the importance of infrastructure. While a lot of light duty vehicles, most of the time they'll be charged at home, it is important to have a robust infrastructure. I don't think anybody really knows



what that's ultimately going to look like, but the government's doing its role in terms of supporting the development of that infrastructure. You have individual manufacturers that are focused in on that, and I'm personally optimistic that over the next five to 10 years, that's going to sort out in the way that provides consumers what they want in terms of features in range. And I'll also point out, if folks have not driven an electric vehicle, they are hot rods. They are very, very desirable.

Jody: You told me a story I want you to repeat. You told me the story once about a Cadillac, I think. The Lyric or something that you sat in or something, and you thought ...

Chet: Right as the pandemic was started, General Motors had a display of their design dome in Warren, Michigan, and I had the opportunity to have some hands on experience with some of their vehicles and the Cadillac Lyric at the time, which was not ... Obviously now there's the production release date and everything is well defined. It was a ground up design car, and I'm telling you, I'm not sure I could afford one, but it is a very, very nice car. It is very impressive, and there's other cars that I've been exposed to that really, really are very, very impressive. Not only in terms of the features and their drivability, but also how they handle and feel and things like that. So it's going to be impressive.

Jody: Well, I drive a Tesla. I'm lucky enough that I have a Tesla. And I have to tell you, I always say all people have to do is drive these cars. And they don't have to be Teslas. The models are proliferating, but I see more and more of these, as you were describing earlier. So many models coming. And when they're well designed, they are unbelievably fun to drive, and people just have to get in and they're going to fall in love with them. I always joke, I would marry my Tesla if I could. I just love that car so much. And driving them is like, you don't even have to care about climate change. I always say this. You don't have to treat it as a green purchase, actually. It's just, they're really good cars. And if you're a car lover, you just fall in love with them. So I think it's a matter of familiarity and experience. And like you said, Chet, some models will not be affordable for everyone. And the key is to have models across the price points so that they can be the mass cars. Not just for people who can afford the level of a Tesla or something, but so that we can really sell them across all of the demographics and make sure they're affordable for everybody.

Chet: Yeah. And I don't want to sound like a commercial for electric vehicles, Jody. But just a couple other data points that I've come across recently is that some of these new introductions, like the Ford lightning and the Mach-E, they're oversubscribed by a factor of two and three. And I read just recently, the Mach-E is actually out selling the ICE version of the Mustang. So there's consumer demand.



Chet: The last thing that I would like to mention is, we could describe this, but if you look at the markets, those companies that are heavily invested in electrification are being rewarded by the markets. Their capitalization is impressive. So we're seeing a lot of things come together here that I think really bodes well for the country going forward.

Jody: And we also should say that the auto industry has played this pretty smart. They have been enlisted in, if not supporting, at least not objecting to the Biden administration's standards. The EPA standards we're talking about today. They were part of the announcement that the White House made about these standards, but they've exacted a price for that. The auto industry has made clear they need help with public charging infrastructure, and certainly got it. The bipartisan infrastructure bill that Congress passed, that is a real success story for the Biden administration, includes \$7.5 billion for EV charging and related programs. That's public money that's going to help build the infrastructure we need. And I think that something like seven billion dollars set aside for battery technology advancement. So there is public investment here. It's not just an expectation that the auto industry will do it all by itself, and it's certainly made clear that it expects that in order for it to be playing its role, and being at least not opposing the Biden standards. It expected this to come from the administration. So do you think that this is a bargain between government and industry that could work?

Chet: Oh, I definitely do. And I think this is a win, win, win that we're seeing come together, in terms of manufacturer's commitments to the technology development. The need for appropriate infrastructure. The question is also, ultimately, is what's government's role in that? But I think that the Biden administration and Congress are trying to strike a good balance there, and also consumer demand. And also how this technology gets rolled out. It's got to be done correctly in terms of making sure that they're produced in the United States, and that those are captured here in the United States. So I think there's a lot of interests that stand to benefit, and their interests are aligned.

Chet: It's really the first time that I've seen something like this, I think in the history of the Clean Air Act around transportation. This is unique what we're witnessing. I think we're witnessing an important development in terms of the future technology really fold out in a real time in front of our eyes. So I think it's really one of the most exciting things I've ever seen in my career, and one in which I think is going to be important for the country in terms of reducing CO2 and criteria.

Chet: And the last thing I would mention here, this is not going to be easy. Okay. This is going to be hard, as most important things in life are. But the signals are there, and the investments and the way things are aligning, but it's got to all come



together. And I really would like to mention that EPA in a standard setting is important to send that long-term market signal to really define what the future will look like.

Jody: And you and I have always talked about this in a very interesting, sort of comprehensive way. You always say things like, "Look, we have to make sure that the jobs are here in the US, and that this is about the future of the American auto industry. It's not just about greenhouse gas standards. It's about doing it in a way that is also good for middle class jobs, and for making sure that we are in charge of our supply chain." You and I have talked about this before that the supply chain for batteries is just really important. And we're dealing with minerals here. Lithium, cobalt, rare earth magnets for motors, and all this stuff that is important for building these cars. And the question is, are we in charge of that supply chain? And are you concerned about that? You've always talked about the importance of that. That it's key to the transition, all these different things that people don't think about, including to think about this manufacturing capacity from a national security perspective.

Chet: Yeah, I absolutely really, really think it is a national security issue, and an important one around especially affecting the automobile sector, and one of our strongest industrial sectors. And the reality here is we have to lead. If we don't lead, other parts of the world are going to take the lead, and they already are leading in terms of battery production and things like that. Now there's been a lot of announcements in terms of bring of production domestically in terms of battery plants, by essentially all the major auto companies within the United States, but also capturing the supply chain, and in doing that it's going to be critically important to securing a healthy, competitive, automobile industry in this country. It is absolutely essential. Otherwise, it's going to be taken away from the United States and seized by other countries.

Jody: Well one of the things you once said to me, I'll wrap up on this thought, is that in this space you have to be a visionary. You have to be optimistic about the vision, and it's easy to feel enthusiastic about these announcements the auto companies are making about going all electric. It feels like an opportunity that we haven't seen before, where, like you said Chet, all the pieces are coming together. Government's playing its role, the industry's playing its role, costs coming down, consumers starting to feel more familiar and more optimistic about driving these cars. Looks like the pieces are coming together. But as you said to me before, getting there is hard work. There's no guarantee that this will be successful. We have to keep plugging away at this.

Jody: And the difference now, I think you said this to me in one of our conversations, the difference now compared to even 10, 12 years ago is that we don't have to invent these cars. They are being produced. But to put the policy in place, the



new standards that EPA has just finalized, the new CO2 standards, to put the policies in place and to be committed about this, it requires constant vigilance. And it's not a matter of an agency setting some standards one time. The agency has to keep at it. We need the Biden administration to come through with the next set of standards for the out years beyond 2026 to keep driving CO2 down. We need the industry's feet to be held to the fire, and we need to help convince consumers that they're going to want to buy these cars. All those pieces are necessary.

Chet: Yes. And most of the rules that I dealt with historically, the technology that we based the standards on existed only in EPA's laboratory. We demonstrated that it was feasible, not from a production perspective, but from a demonstration perspective. And with appropriate lead time, we forecast that technology could be introduced in the marketplace, and I think the EPA has a proven track record for doing that. This is absolutely different. The technology exists. They're in production, and with massive investments going on around us every day. And it's important for the government not to be followers, but to lead going forward, in recognizing that this is different.

Chet: I think my fear is, if you bear with me a second, is that it would be easy for the government to be a little bit more cautious here since the market's moving. I think that's the most dangerous thing to do. Because as I mentioned a couple times earlier, we're at an inflection point. We can either continue the trajectory we were on, or it could stall. I think there's a real possibility without strong leadership from the federal government that it could very well stall.

Jody: And I think we'll wrap it up. You and I could talk forever, I know, about this. But I will say, I do find this issue and the transportation sector and its importance to solving the climate challenge, it really can't be overstated. If we can get a handle on the greenhouse gas emissions in the transportation sector, we can do it through policies like this, led by agencies like EPA, in partnership with an industry that's prepared and planning for a transition, with the support of the Congress and the states, important states like California, which has a long history of setting ambitious standards for cars and trucks. If we can put all these pieces in place it's a win for public health, it's a win for consumers, it's a win for climate change policy, it's a win for the industry in terms of its global competitiveness. And that's what I love about the policy we're seeing emerge here. It's just an all around win-win-win.

Chet: Yeah. I agree, Jody. And one of my favorite quotes from President Kennedy back around the space program and putting a person on the moon, is that we choose to do it not because it's easy, but because it's hard. And I think that's where we're at right now. In some respects, we want to believe it's easy, but it's not. It's going to be hard. But we have all the tools and all the momentum to make it happen.



Jody: Well Chet, I can't imagine a better person to talk to about these issues, about EPA's new rule. It's just been a pleasure. I so appreciate you spending time with us on CleanLaw, and I look forward to more conversations in the future.

Chet: Oh, well thank you so much. I really appreciate the opportunity. This has been a great conversation. Just very exciting, and it renewed my excitement level going forward.

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