

Transcript for #72. Reforming Transportation Through Electrification, Ride Sharing and Automation, Part 2

August 1, 2022

Guest Dan Sperling, Founding Director, Institute of Transportation Studies

Intro ([00:01](#)):

You're listening to Fueling the Future of Transport hosted by Tammy Klein, the founder and CEO of Transport Energy Strategies. We'll talk all about the fuels and energy. It takes to keep the world moving forward.

Tammy Klein ([00:17](#)):

On our last show, I talked with Daniel Sperling who not only founded the Institute of Transportation Studies at UC Davis, but is also a Board Member of the California Air Resources Board. If you haven't listened, I encourage you to go back to the first episode and hear all his insights on The Three Revolutions. Here's the remainder of his interview, and I hope you enjoy it as much as I did.

Tammy Klein ([00:40](#)):

So let me turn to another topic and ask you about the Low Carbon Fuel Standard. So it's been litigated. It's here, it's working. It was, I wanna say, reissued in 2018, strengthened, lengthened. What's your outlook? Now some amendments are being considered. What's your outlook for where you see the LCFS going in the next five years and what do you think should happen in your view? I mean, we're seeing a lot of scale-up of electrification generating credits, we see a lot of HVO or renewable diesel plants that are coming, we see a lot of renewable natural gas in the states, how do you feel about all that? And what's your outlook? So what would you like to see happen?

Daniel Sperling ([01:44](#)):

Okay. So I have the exact answers for you <laugh> and you'll hear it first here because a lot there's not been much public discussion of it, so I will. But let me give just a tiny bit of history and explanation for listeners. And that is, it was first adopted in 2009 in California. It's been subsequently adopted in Oregon, just recently Washington, British Columbia, the country of Canada is adopting it. They sometimes call it the Clean Fuel Standard. They're kind of wimpy, they're afraid to use the word carbon or at least they used to, but so it got started 2009. And at first, it went through a period where I called it, the unloved child, there was...

Tammy Klein ([02:37](#)):

It was definitely unloved <laugh>

Daniel Sperling ([02:39](#)):

It was definitely unloved. There were lawsuits, the ethanol industry filed lawsuits, didn't like it, the oil industry didn't like it, and the only ones that liked it were the advanced biofuel companies. And there were very, very few of those.

Tammy Klein ([02:56](#)):

Yes, yes. I remember.

Daniel Sperling ([02:58](#)):

And you know, it's made a big comeback since then. In fact, I heard three or four years ago, there was a vice president from the natural gas utility companies in California said this is the best policy California ever adopted. And in a moment, we'll describe why that person said that. And so it's really become one of the most popular, supported policies in many of these states and that's because it kind of has something for everyone. So as I said, the natural gas utilities like it because they're being pressured to give up on fossil gas so they need something. So the biogas, renewable natural gas is a good alternative for them. The electric utilities get credit for electricity they sell to electric vehicles. Even the oil companies see some advantage of it because we give credits for them doing carbon capture and sequestration.

Daniel Sperling (04:05):

We give credits if they use innovative processes upstream, like they use solar energy in the oil fields, they get credit and then we also gave credits, early credits for hydrogen stations. So those that want to invest in hydrogen stations. So, there's a lot and the car companies like it, because we've bundled some of the credits together to be a rebate to buyers of electric vehicles. So it's really become a very popular policy. It's got a lot. It was kind of my politics 101 lesson that you need to create a lot of good constituencies, economic constituencies, and political constituencies. And that's what LCFS has. Mission accomplished. Mission accomplished. So now going forward. So the credit...so it has tradable credits so when the regulated party is the oil refinery.

Daniel Sperling (04:59):

So if they can't, or don't want to meet the requirement, which is the requirements are, you have to reduce the carbon intensity of the fuel you sell. If they can't, or don't want to do it, they can buy credits from someone else. And so the credit price has been, was up to \$200 a ton of carbon, which is really high. And it really has played a huge role in motivating companies to invest in renewable energy, to innovate. And it's had a very positive effect. And not only just with new investments, it's like oil sands companies figured out ways to just be more efficient and reduce their carbon footprint oil companies. So it's really had a far-reaching effect across the energy industries, but now what's happening is there's a lot of electric vehicles starting to be sold. So that generates more credits. There's some of the oil companies are converting their oil refineries to make renewable diesel fuel and that's generating a lot of credit. So it's pushed the price down close to a hundred dollars. And the investment community is quite...I would use the word freaking out. <laugh>, they're really...and I've been talking to a lot of investors about this and another constituency is Wall Street investment...

Tammy Klein (06:32):

Banks.

Daniel Sperling (06:32):

The banks. And who knew, right? So they're really concerned because they need those incentives to justify making these new investments. And I would point out none of this is government money, none of this. So this is a case where there's no taxpayer money, no government money. And it's a beautiful policy in that sense. So now CARB is realizing there's a problem. We need to fix it up somehow. So just to be real brief CARB is going to have our first workshop in about a month, month and a half, to start the process of amending it. And basically what we're gonna do almost for sure is greatly increase the carbon intensity requirement. Basically it's a performance standard. So right now it says 20% reduction in carbon intensity by 2030, we're gonna make that much, much higher and force much more innovation and investment. And then we're gonna clean it up a lot. Some we have little things, in the beginning, we were desperate to get any credit any fuels, low carbon fuels we could, but now it's happening. We can clean it up.

Tammy Klein (08:00):

I remember John Curtis used to ask me because he used to track a lot of the cellulosic ethanol, is anything coming? Is anything coming? Is anything coming? And I'm like, well, not imminently, no. <Laugh> There was just this looking for sources and sources and sources. And in the early years of the LCFS, it was like you say, it was tough. It was...it was a little tough.

Daniel Sperling ([08:27](#)):

And the one thing that LCFS has not achieved is it really hasn't motivated a lot of investment in cellulosic fuels, but I think we're right on the cusp of that happening. And so that's why these new changes, I think really will finally push, pull more money into the advanced biofuels in cellulose but no other policy is doing it. So I used to talk to the oil companies a lot and they said, well if we have to have a climate policy, the LCFS is as good as it gets. And so I think that's kind of the case. About seven or eight years ago when we launched it, I did a tour, actually. I had a debate with an Exxon guy about the LCFS, went around the country and at the end of it, people would always criticize it and I'd always say, okay, what's better. And I have to say in all those public talks, all those interactions with oil companies, NGOs, no one ever came up with a better policy. So I'm sticking with it.

Tammy Klein ([09:41](#)):

<laugh>, That's your story. And you're sticking with it. <laugh> So can you talk a little bit more or is it too early to ask what we are talking about when we're talking about tightening targets increasing the percentage reduction from 20%, what are we talking here? Are we talking 30? Are we talking 40? Are we talking by 2030? Are we talking by 2040? So I wanted to ask that and it's clear to me that you do see, even though you've been a real champion of electrification, you do see a role for biofuels or bio-based fuels to continue to play a role, some kind of role, in the fuel pool going forward. So can you talk a little bit more about that too?

Daniel Sperling ([10:31](#)):

Well, we definitely need biofuels for aviation. You know, maybe some of the really short flights we can do with electric or hydrogen, but the cross-country flights, the international flights, you need biofuels, low carbon biofuels. Probably for maritime for ocean shipping, probably need biofuels also. So those are the two areas and they represent very significant markets. So beyond that, there is interest in using it in long-haul trucks. Because you know, putting a lot of batteries or a lot of hydrogen into a long haul truck gets expensive and heavy, but in California, I have to say the law, the regulation we adopted, does not allow for biofuels in trucking. But I think other states and other countries will be more lenient on that, I suspect. And so there'll be a market for biofuels and long haul trucking as well. And then we have all these cars and trucks on the road that are running on gasoline and diesel now and they're gonna be around a long time. So we'll call them legacy vehicles. And so we'll need some kind of biofuel. We'll want to have biofuels for them. You know, if we're serious about really reducing carbon in California, we have the target of net-zero carbon in 2045.

Tammy Klein ([12:09](#)):

Yeah.

Daniel Sperling ([12:10](#)):

And other...obviously the US will be behind many other countries, so we're gonna probably need biofuels for many of our cars and trucks for a very long time. So yes, I see a market for it. So with the LCFS you ask how much we untighten it. So it's 20%, I'd say, so this is me speaking right now. But me being very informed and I have talked to many of the key people on this, I think at least 25% and, and very possibly even likely significantly more than that. Partly we have to go and sit

down and calculate, how many credits are going to be generated by all these electric vehicles? How many credits are going to be generated by these new renewable diesel refineries and figure out how much of the credits itself takes up and therefore, how much should we increase the stringency of the standard.

Tammy Klein ([13:20](#)):

So last question, or next to last question, how do you see...we talked about the earlier in the Three Revolutions...electric vehicles. How do you see charging developing in California and in the US over the next 10 years? Is it going to be...there are some real, as someone who's been working in electrification and on charging herself, I do see there's some real issues out there in terms of removing the barriers to get charging put into place. So is there gonna be enough charging to sort of help consumers get over the hump? Some of the resistance to purchasing an electric vehicle and is there gonna be enough to be able to meet targets in California and in the other states that are following ACC 2. So how do you see that happening and evolving for charging?

Daniel Sperling ([14:20](#)):

And just to make it a little more difficult <laugh> this is for trucks too, we're talking about, not just for passenger vehicles.

Tammy Klein ([14:25](#)):

Right. Exactly, exactly. Because we have an act now. Yes, exactly.

Daniel Sperling ([14:29](#)):

So well California is putting massive amounts of money into infrastructure. The Federal, the Biden Administration, the one thing it has done in the EV area, it has allocated, awarded quite a bit of money through the infrastructure bill for EVs. But it's a slow process. So first of all, we don't really even know how to spend that money. You know, how much of it should be subsidy, how much should be the private companies paying for it. And the reality is, it's really hard to make money selling electrons to vehicles. You know the business case is really weak. And so government money, or it's not necessarily just government money, it's some kind of subsidies are needed. So there are three types of charging, there's home charging, there's workplace charging and public charging.

Daniel Sperling ([15:35](#)):

So for the workplace charging, a lot of employers are subsidizing it as a fringe benefit for their employees, public charging. There is the government money, but there's also retail, at shopping malls. The shopping mall will subsidize it again as a service to their customers to attract customers. So we do need money to come in from different places to make this work in the beginning. Most of the people buying electric vehicles have their own homes and have a place to charge. And so in the early years, it's not quite as critical to have that public charging, but as we get deeper into the market, now you have people living in apartments and condos. Now you have people that are into their second or third car, and they don't have easy ways of charging at home.

Daniel Sperling ([16:38](#)):

And so now it starts becoming really critical. And the reality is it's really slow getting these chargers built and there's permits and local governments, and NIMBYism all this a lot of challenges getting it done. And so it takes years. And that's why, so we have some time, but given <laugh> how hard it is, we really need to be doing it quickly. And we need a massive number of public chargers. And Tammy, as you were suggesting even for people today for psychological reasons,

you need the public chargers out there. And for longer distance travel too, you need them out there as well. But we are seeing 85 to 90% of the charging by these initial cars done at home.

Tammy Klein ([17:38](#)):

So you still think that barring some of these issues, you think that they will be worked out over time and that the state will be able to meet its targets are coming really darn close. As time goes on, I mean, we have 12, 13... 13 years...a lot can happen in 13 years.

Daniel Sperling ([18:01](#)):

There's gonna be big challenges with the chargers, there's reliability issues because you know, what happens now is companies build them, but they're not responsible for maintaining them in some cases. So there's been studies done that just show a lot of them are not anecdotally anyone that has electric vehicles knows this, unless you have a Tesla. So Tesla is a model of how to do it. Right.

Tammy Klein ([18:30](#)):

Yes.

Daniel Sperling ([18:32](#)):

But they did it basically. So in that case, the company subsidized it...

Tammy Klein ([18:38](#)):

Which was brilliant.

Daniel Sperling ([18:39](#)):

Yeah. And it worked well and they do a good job of it, these other cases the reliability isn't there, the accountability's not there. So part of it is the government that's handing out the money has to figure out how to make sure that they are getting reliability and accountability. So there's gonna be challenges for sure. And on the consumer side, there's gonna be challenges because I'm starting to think, we have a big research team at UC Davis looking at this and we've kind of come to a conclusion. The first 50, 70% is going to be relatively easy. But then we get to the last 30%. So that's people that live in apartment buildings, condos, people that are just ideologically opposed. I mean, look at...look at vaccinations. We can't even get people vaccinated. Are we gonna get them to buy an electric car?

Tammy Klein ([19:35](#)):

Right. Right. That's true. That's true.

Daniel Sperling ([19:39](#)):

So we're gonna have to keep at it. It's not gonna get easier over time as we go along here, it's actually gonna get harder.

Tammy Klein ([19:48](#)):

Yeah. And to be prepared for that eventuality. So my real last question is, you've worked in the whole broad spectrum of transport energy. We didn't even get to some of the things that you've done in the past, things that you're involved in

now. But the question I want to ask you is what excites you about this space, transport energy in general? What really gets you out of bed in the morning and gets you kind of gets you going? You've seen so much and you've done so much. What's exciting about what's happening right now?

Daniel Sperling ([20:35](#)):

You know, I've been doing this for 40 years and this is the most exciting time in that whole period. I tell my grad students they're so fortunate that they're coming into it just at the right time, because there's a recognition that change is needed in the car-centric model that we've developed. I talk about the marginalization of people, environmental justice, social justice, people starting to appreciate how important that is to deal with it. And then there's the big kahuna of climate and then you have on top of that, all of this innovation and new technology coming along... that's The Three Revolutions. That's what motivated me to write that book. And so this is the time. This is it. And now for me personally, I'm having more impact than I ever did, just because my first 20 years, no one really even cared about what I was doing, working the fuels. And, you know you were talking about your former boss, Fred Potter and we were kind of whistling in the wilderness <laugh> for those years.

Tammy Klein ([21:52](#)):

That's right. He was a big proponent of cleaner fuels, as was I. I think he'd be stunned at what was happening now.

Daniel Sperling ([22:00](#)):

Yeah. And, now it's...so this is the time. There's a guy that works with me. He's 91 years old. He's worked on electric vehicles and batteries his whole life. He says the same thing.

Tammy Klein ([22:14](#)):

Oh my gosh!

Daniel Sperling ([22:15](#)):

'This is the best time ever,' he says, 'I can't retire.' <laugh> He's still writing papers and mentoring students that this is it right now.

Tammy Klein ([22:25](#)):

You know, I think what you're saying is really, really true just to conclude because you know, in my career it's like, when I first started my consultancy, I was like...well I really don't have a niche because I did a lot of work on improving fuel quality, sulfur reduction, lead phase-out, RFG oxygenate usage. And then I did a lot of work on alternative fuels when no one really cared about alternative fuels <laugh>. And then biofuels. And when I first started, I was like I've got this disparate background. But no, I think I realized over time, no, it's enriching because I've had these different experiences working with countries, working with different clients on these different topics and you need that.

Tammy Klein ([23:20](#)):

It's helpful to have a broad base of things that were done in the past that maybe, well, a lot of times, didn't work <laugh> and then bridging into this new realm that we're in with electrification and hydrogen, these alt fuels that you didn't think were gonna go anywhere in the late nineties, early two-thousands, and now here we are. So I think what you're saying is

true and I think that's what also motivates me is...I'm 50, it's impact time. Let's do this <laugh> let's make this happen. A lot of the threads are there. We just need to put 'em together.

Daniel Sperling ([24:04](#)):

Well that small cohort of us that did go through that experience. There are so few of us that remember the history, that know the lessons learned, what worked, what didn't, and now here we are. So that's why it is really important for this, a small cohort, to really be active now because you know, it's kind of like in organizations you think about institutional knowledge. This is even much broader than that.

Tammy Klein ([24:38](#)):

That's right. That's right.

Daniel Sperling ([24:39](#)):

There we go.

Tammy Klein ([24:40](#)):

As I like to joke, I know where some of the bodies are buried <laugh> It's important. It's important to know that as gruesome as that may sound. Well, thank you so much for joining us today, Dan, it was a great, great pleasure to talk with you. And I look forward to continuing to stay in touch and follow The Three Revolutions work and just what you guys are doing at ITS, which I think is so great. And I really appreciate it and thanks to everyone for listening.

Daniel Sperling ([25:16](#)):

Well, thank you, Tammy. It's been a pleasure.

Tammy Klein ([25:18](#)):

<laugh> Thanks again.

Outro ([25:24](#)):

You've been listening to Fueling the Future of Transport. This show is hosted and edited by Tammy Klein, produced by Carolyn Schnare and engineered by Aleksander Nikolic. To hear more great episodes of this show, learn more, and sign up for a free biweekly newsletter, visit transportenergystrategies.com.