JON CANNON: Hi, everyone. I'm Jon Cannon. We're delighted to have Mary Nichols and Ann Carlson with us this afternoon to talk about clean air in Los Angeles, the state of California, and the nation. This discussion is the second in the series *Place and Power,* sponsored by the University of Virginia's Program and Law Communities and the Environment, PLACE, and by the *Virginia Environmental Law Journal* and the *Virginia Environmental Law Forum.* In this series, we explore connections between human place-based relationships and the law and politics of environmental governance.

I had the pleasure of working with Mary Nichols when she led the nation's Clean Air programs at EPA during the Clinton administration. That position is just one of Mary's leadership positions that have made her among the most influential environmental regulators of a generation. Mary is now the chair of the California Air Resources Board, which administers the state's air quality programs and the state's signature AB 32 climate change program, the most ambitious and sophisticated program for reducing greenhouse gas emissions in the world, I will say.

Mary has served on the board under no fewer than three California governors, including under Governor Jerry Brown for both of his terms, and has been indispensable to the success of AB 32 and the clean up of California's air.

Ann Carlson is the Shirley Shapiro Professor of Environmental Law and the director of the Emmett Institute at the University of California at Los Angeles. She is a distinguished law teacher and scholar, author of many articles on air quality and climate change, a leading casebook on environmental law, and a recent book co-edited with Dallas Burtraw on *Lessons from The Clean Air Act, Building Durability and Flexibility Into US Climate and Energy Policy,* and is now at work on a book on her beloved LA's successful efforts to clean up its air and the combined energies of politicians and regulators and innovators and plain citizens in bringing about that signal success.

Mary's and Ann's discussion will be moderated by my colleague, Mike Livermore, who is the Edward F. Howrey Professor of Law here at UVA Law School. About halfway through the discussion, we'll move to questions from our audience. So those of you who are viewing, please post your questions for Ann and Mary on the Q&A

tab that should show up on your screen. And we will pick them up from there. Thank you, again, Ann and Mary for joining us, and thank you, Mike.

MIKE LIVERMORE: Well, thanks very much, Jon. It's such a delight to have Ann and Mary here for this conversation. We're looking forward to a really interesting conversation. Again, I want to encourage participants in the audience to type in questions in the Q&A. And then we'll get to those in the second half of the conversation today.

So the topic of this conversation is one of the kind of traditional questions in US environmental law, especially, which is the role of states and the federal government and localities in shaping environmental governance. And there really couldn't be two better positioned folks to help us kind of illuminate this question over the next hour or so.

So Mary, just to get us started, your career has spanned all three levels of government. You represented cities when you first got started in environmental law. You obviously have played a huge role at the state of California. And you've been a regulator at the federal level.

So you've seen the question of environmental federalism from all sides. So one question is, just given that you have so many kind of cooks at the pot, what are some ways that having these multiple regulators, this multiple level of governance involved in making environmental policy helps move the ball forward? How is it productive for actually getting results?

MARY NICHOLS: I think the best answer to that is to underscore the continuing dialogue, sometimes conflict, between the different levels of government over how to go about approaching the problem of pollution, while at the same time recognizing that the public demand for cleaner air, regardless of whose job it is to provide it, has never flagged throughout all of this period, in good economic times and bad. And around the country, if anything, the public insistence that they be provided healthy air and that whoever it is who is responsible for doing something about it do their job has only grown over time. It's sometimes a little disappointing, actually, to realize that people my age who lived through some of the worst days of smog recognize how much progress has been made. And I even get thanks from strangers sometimes at parties and so forth.

But for most people who've come here in more recent years, or who are just growing up, they don't think the air is wonderful. They think it needs more work. And they just want to push me and the local air district and the feds to do whatever it is they could be doing to fix that problem.

MIKE LIVERMORE: Yeah. It's an interesting point on the kind of increasing demand over time. So that you get this increased demand while things are getting better. Now have you found that that's a source of frustration? Is it problematic that we kind of don't notice that the air has actually-- that we don't recognize the progress that's been made? Or do you see this as largely a positive thing, that we keep on demanding better?

MARY NICHOLS: I think it's only positive. First of all, the fact is that the science keeps on identifying adverse effects at lower and lower levels. And that's not something that we can do anything about. I mean, except ignore science, which some people would probably prefer that we do.

But assuming that we care about actually understanding the impacts of this stuff, we now know that even at very low levels, there still are effects on pregnant women, on fetuses, on aging people. You name it, we can find the effects. Now maybe if we didn't look, again, we would just feel fine.

But I think that people also, as they become accustomed to any particular level of clean air, take it for granted. And they don't understand why anybody would want to make it worse. They frankly can't believe it. That when they hear that are rollbacks going on, or efforts being made to deregulate, and at the same time they see that there's new technology, there's a new ethic out there, particularly I think in the generation that's rising up, about people's relationship to the planet. And so they're going to keep pushing us. And honestly, it's a great thing.

MIKE LIVERMORE: So Ann, you're working on a book right now on air quality in LA that relates to some of these themes. Where at least my understanding is that folks don't appreciate the extent to which air quality has improved in LA. And LA has something of an undeserved continued reputation for being a smoggy dirty place.

ANN CARLSON: It's true. So I think Mary is right, on the one hand, that it's a good thing that people demand cleaner air. But I guess what frustrates me is that people don't fully

understand what an extraordinary job government has done to get us to where we are today.

And so I thought I would just give you a few statistics, just to let people understand just how bad the air quality was. Mary moved to Los Angeles, I think, in 1970. Is that right, Mary, right around then. I grew up in Los Angeles. So I was a 10-year-old in 1970. So I have lived and breathed the Los Angeles air for most of my life.

Just to put things in perspective, in 1970, when the Clean Air Act passed, Los Angeles had 240 days that violated an air standard that was almost double what our air standard is today for ozone. And on 220 of those days, we had what were called smog alerts. We had a Stage 1 smog alert 220 days of the year.

The air quality was about 300% worse on those days than what the federal standards call for today. 135 days, we had Stage 2 smog alerts, 500% worse than what we're supposed to experience. And on nine days, we had what were called Stage 3 smog alerts, where all industry and driving was supposed to stop. And this was just a regular part of our background.

A couple of other staff-- I'll try not to get too wonky here-- but lead is another really good example. So kids in the 1970s, because they were exposed to lead that deposited on surfaces after it was emitted from the tailpipes of cars, had blood lead levels that were about 1,000% higher than blood levels of kids today in Flint, Michigan who've been exposed to lead in their drinking water. That's just average. African-American kids had lead levels that were double white kids' blood lead levels, which were already extraordinarily high. There are social scientists that have pretty good evidence that violent crime has been reduced as a result of the reduction in lead in the atmosphere and background air.

That's because of the Clean Air Act. Just, again, to put it in perspective, in the 1970s, we used to violate the lead standards by 50 times the current standard. So it was just poisonous to live here. We violated carbon and monoxide standards 366 days of the year in a leap year. I mean, it was crazy, crazy dirty.

And so I do get frustrated that people don't understand what it took to get our air to today where, for example, 2018, Los Angeles County, which is part of a bigger air basin, had one ozone violation. We had nine violations in the whole basin for fine

particulate matter. And we didn't violate any other standard.

When we do violate ozone standards, which we do far too much, I don't want to suggest that we're done. But when we violate those ozone standards, it's at levels that are not much above a very tough standard to meet. And a lot of that pollution, a lot of the background ozone is actually naturally occurring.

I think the big thing we now need to worry about is what Mary is at the helm of doing. And that is not just cutting greenhouse gas emissions, but preventing the deterioration in our air quality as a result of climate change. So we're getting worse ozone days because of water temperatures.

And of course, the wildfires are creating horrible particulate pollution. That isn't even something that air agencies have eve had to deal with before. What do you do with how do you stop fires, creating the kinds of air problems we have today? I do think people should understand that under the leadership of people like Mary Nichols, California and the rest of the country has really done an incredible job cleaning up our air and producing incredible health improvements as a result.

MIKE LIVERMORE: Great. Thanks, Ann. So just kind of bouncing off of that, I mean, it's an enormous amount of progress. It's just demonstrable, numerical progress that has had enormous influence on people's lives.

I tell my students if they think they're smarter than their environmental law professors, it's because they grew up when there was less lead in the air.

ANN CARLSON: [INAUDIBLE] for what it's worth.

MIKE LIVERMORE: So one question is just what lesson do we learn from this? So Mary, as you've observed and been part of this environmental progress at the state level in California and LA specifically, what lessons do you think we can draw going forward for environmental challenges in the future, but also for national regulators, thinking about this discourse that you were describing between the state, the local, and the federal level? What can the feds learn from progress that's been made in California on these issues?

MARY Well, you mentioned my stint at EPA during the Clinton administration, which was

NICHOLS: immediately following the passage of the latest round of updates to the Clean Air Act Amendment that added a bunch of new provisions, including the acid rain provision and a requirement that areas that had really bad air quality had to implement programs to inspect and require a maintaining of automobiles, a whole new generation of vehicle emission standards came in. And when I went back to DC, at the time I was working for the Natural Resources Defense Council when I was appointed by the president, I spent my four years in office there mostly, not completely, but mostly replicating things that we had already done in California.

The lesson of that is that states are able to try things and pioneer in ways that the federal government can't. And the need to balance and to negotiate among the states that come from very different geographical and different energy resources, different political situations at any given time, is a huge issue for the federal government. It's very, very difficult to do a national program and have real equity around the entire United States.

But I think the lesson is that this is an area where, because it's about public health, concern comes from the bottom, from the people, and filters its way up to the national level rather than the other way around. And the job of the federal government, I think primarily at the behest of the regulator community, frankly, is to find a way to supply that need and at the same time create some kind of a reasonable regulatory environment that will encourage innovation but not produce a complete backlash.

MIKE LIVERMORE: Yeah. I mean, it's a really interesting thought, this kind of a bottom up process and then that kind of particular role of the federal government in creating some rationality maybe outside of this kind of bubbling up that you get at the state and local level.

MARY NICHOLS: Well, everybody-- I'm sorry, just to complete the thought here-- when people are angry about what they think is a failure of their local government, they come to the state and demand that we act and that we insert ourselves in the process and take over. This happens all the time with toxic waste cleanups, for example. If the state isn't doing its job, or isn't seen as doing its job, then they go to the federal government.

And when the first big Clean Air Act was passed back in 1970, that was the situation in this country. And ever since then, there's been some back and forth, I think, over time. But ironically, we're back at a point now where people perceive that the federal government is the one that isn't doing its job. And so there is more of a movement towards giving the states and the locals more authority, more autonomy, and putting on the pressure to get more action on cleaning up. They are coming from that level.

MIKE LIVERMORE: This has certainly been a huge development the last several years is that the state's been asked to take this leading role. So maybe, for both Ann and Mary, just given this kind of the current state of affairs with respect to state-federal relationships on environmental policy, I think a lot of folks would agree that we're not at a high point of collaboration and cooperation between the states and the federal government to achieve environmental goals. And so just looking forward, what do you think needs to be done to re-establish what might be a more productive relationship between the states and the federal government.

MARY NICHOLS: Ann, why don't you start with that?

ANN CARLSON: How political should I get here?

MIKE LIVERMORE: You don't endorse candidates.

ANN CARLSON: We need a federal government that believes in environmental protection, that believes we need to be doing something about climate change, and that believes, as virtually every other president has believed, that California has a really important role to play in that. So the battle over California's ability to issue tailpipe standards for greenhouse gases and for zero emission vehicles shouldn't be a battle. This has been an extraordinarily successful experiment, having California have special authority to regulate, again, often with Mary at the helm. And not just with cars, this is with all sorts of off road vehicle engines, boats, all sorts of things.

And it's been an extraordinarily productive relationship. Because as Mary had previously said, when it works, the rest of the country can follow our lead. When it doesn't work, they don't have to. So I like to point out sometimes that California's

initial zero emission vehicle program was not an incredible success.

There were significant problems with it. The state ended up having to roll back some of the requirements. It did probably lay the groundwork for the development of electric vehicles and hybrid technology. But it was expensive, and it didn't spread to the rest of the country.

That's OK. Because that's part of this experimental kind of base that we have that I think was a really visionary move by the authors of the Clean Air Act. Actually, the California exception came before 1970. So we need a federal government that believes that environmental protection is a top priority and that respects and understands the role that states can play. Without that, it's really, for me at least, hard to see a path forward. I'll let Mary jump in now.

[LAUGHS]

MARY NICHOLS: Well, can we reaffirm the relationship or can we at least have a reset and then start on a better footing with the federal government? Yes. Of course we can. It's always possible.

The state really can't do its thing without the backdrop of national ambient air quality standards. We have the ability to set air quality standards at the state level. It's in our state legislation that created the Air Resources Board.

But that's a long, slow, painful, costly process. And it's been done, but very, very rarely. Generally speaking, we rely on the federal government to set the basic level of, definition, really, of what Clean Air is. Certainly when it comes to the problem of global warming, which is, as it says, a global problem, we need the United States government at the table in the international arena to advance our interests and to promote our ideas and technologies.

I think people sometimes forget that the basic architecture of the existing Kyoto accord came from America, came from the US, in the international climate negotiations. And even though our country never was able to implement the program the way it was originally intended, the Europeans, China, New Zealand, and others have picked up those ideas and actually are advancing them and elaborating on them. So the fact that we could be taken over or overtaken by the

federal government in this area would be terrific. It would be devoutly to be hoped for. And so we not only wouldn't fight it, we would be doing our best to try to help make it happen.

The other side of this equation, which you ventured earlier, is the relationship with local government. And, again, although the state has the program and I think is the right level to be setting the emission standards for vehicles and related standards for fuels, for regulating the electricity system, local governments are increasingly stepping up to the plate and adopting their own climate action plans and putting air quality and equity into those plans and moving forward at using their own authorities over their streets and highways and building permits and so forth to push for a better environment at the urban level. And when you have mega cities, like Los Angeles, they have not necessarily all the financial resources, but they certainly have the political and intellectual resources to take on a project like that.

MIKE LIVERMORE: Great. So we have some--

ANN CARLSON: Can I just-- one other thought here. So one thing to keep in mind at a time when the federal government is pretty hostile to leading on the environment, the history of the Clean Air Act really shows that localities, California, and the federal government have been extraordinarily important. California hasn't always led.

So just let me give you two examples. Mary was involved in the first one. So this Southern California area was supposed to prepare a state implementation plan after the Clean Air Act was passed in 1970 and refused to do so. And they refused to do so, in part, because it was virtually impossible to show how this area was going to come into compliance with the Clean Air Act without basically shutting down.

I think one of Mary's very first cases, and I think either the first or the second case ever filed under the Clean Air Act, was representing some of the Eastern cities in the district, demanding that the federal government get involved and issue a federal implementation plan, in part to put pressure on Southern California. It wasn't until 1997 that the South Coast District had a federally approved state implementation plan for ozone.

One other battle also involved Mary when she was in the EPA when Clinton was

president. And that was she referred to the inspection and maintenance program. But this was a newly enhanced requirement in 1990. And particularly polluted areas really had to kind of step up and improve the smog check program, that's probably what you're all familiar with it being called.

And California really dragged its feet. And EPA got very close to sanctioning the state. And then the 1994 earthquake hit Northridge. The sanction would have been the withdrawal of highway funds.

So there are these battles that are really interesting, where the federal government really is the leader and California's recalcitrant. And I think it's the dynamic of these three bodies, the locals, the state, and the federal government that gets played out in other states, too-- this is not unique to California-- It. Is something that's made the Clean Air Act so powerful and so important. And so having federal leadership again to clean up our air and to focus on climate change, I think is just imperative.

MIKE LIVERMORE: And I think one of the points that Mary raised earlier is kind of related, I think relates to this, is just the diversity of states. States are different from each other. We have a diverse political culture. We have diverse geographies. We have diverse pollution problems.

And we have diverse polities in many ways. And regardless of who wins the presidential election, we have deep divisions in our political culture. And as both of you know, it takes a long time to address environmental problems.

It takes consistency. It takes stability in your policy regimes. And so one of the challenges in the next decades is just building the kind of sustainable pressure that, if you look at the success of the Clean Air Act, that's part of the story. That there's different pressure valves, but there's always some point of pressure. So going forward and thinking about the next generation of environmental problems or the current generation climate change and the like, how do we build those kinds of sustainable structures, or those sustainable pressures in light of what seems to be quite deep political divisions over environmental issues?

MARY NICHOLS: So I don't think there is such a huge division if you can get people to sit down and talk about the goals. And if you could create a system where you allow for quite a bit of flexibility in implementation, but put in place a set of goals which are pretty

much untouchable. And part of the genius of the Clean Air Act was it did that. It's true that the National Ambient Air Quality Standards have been tightened a couple of times over time. But those changes are relatively minor and not tremendously action forcing.

The fact that the standards were there, that they could be seen by everybody, that they had a strong technical and scientific basis to them, and then that there were requirements to try to attain those standards, gave industries and entrepreneurs and investors, as well as the environmental community, something to aim for, something to argue about the means, even argue about the timing when it turned out that they weren't attainable or couldn't or seemed to be too politically difficult to attain, as has happened several times over the course of the Clean Air Act. But it still kept everybody moving forward. And I think that really is the right recipe.

I worry about the increasing desire on the part of legislators and members of Congress, as well, to say they can't delegate any authority to an administrative agency. Because you were right that it takes a long time to pass legislation, more so at the federal level certainly than at the state or local level. But still, sometimes you hit a problem that you can see that something isn't working. And rather than tear down the whole system, you need to deflect a little bit, which is what we've been able to do in California, as Ann pointed out, when we tried something that didn't work quite the way it was planned.

ANN CARLSON: Well, I would just add two points. One is one of the reasons that we got strong federal legislation on the Clean Air Act when the Clean Air Act was passed in 1970 is because people were fed up with pollution. They could see it all around them. They could feel it in their eyes and their lungs. It was visibly ugly.

And even the business community in Southern California understood that terrible smog was a threat to economic prosperity. So there was a lot of pressure because people feel it. And I think one thing that's really happened in the last, really, only two or three years, is that the effects of climate change are being felt on the ground. The politics have changed.

So of course, here in California, we're experiencing record wildfires. Four million acres of the state have burned. So far this year, we're hoping that today is not a

terrible fire day, because it's very dry and hot and there are worries that winds are going to kick up. We're experiencing drought, plus hurricanes are more intense, flooding, sea level rise. I mean, you name it, people can see it.

They can't see it as frequently as you could see smog, at least in Southern California those 240 days a year, but I think that's had a huge effect. And I think the other thing that is going to drive change at the federal level is people who are a lot younger than I am. So watching the rise of the Sunrise Movement and people like AOC and others who are young and energetic and mad and demanding change is, I think, the best thing that can happen to Congress. Because Congress hasn't felt that much pressure on climate change.

It felt a lot of pressure-- you know, something like 100 million people showed up for Earth Day in 1970. We don't have that kind of public pressure on climate change. And there's some reasons for that. Right?

A lot of the effects are going to be felt long in the future. You don't see it in the sky in the same way that you do smog. But I do think that this rise of young people demanding action and shaming older people, which I think is appropriate, for inaction is really key to move the politics going forward.

The only other thing I will say is that I agree with Mary in worrying about overprescription and federal legislation and lack of an ability to delegate. It's important to note that the Supreme Court is potentially a big problem here. Because five members of the Supreme Court have suggested that they don't like delegation to administrative agencies. EPA is going to be right at the heart of that.

And I suspect, although we don't know, given the way that questions get asked and answered in Court hearings, that there's going to be a sixth member of the Court who is going to be interested in reviving the nondelegation doctrine. So there's a lot to watch for. But Congress also may have no choice but to be very prescriptive if it's worried about what might happen if the Supreme Court weighs in on the constitutionality issue.

MIKE LIVERMORE: So this directly raises a question that came in from one of our participants. And I just want to remind folks who are watching that if you have a question, go ahead and shoot it in using the Q&A little button at the bottom of the screen. And we'll get

through as many of them as possible.

But just getting to this exact-- we did get a question along these lines-- of what about the future of the Court and how that might affect environmental law and the ability of federal agencies to be effective going forward. So just to kind of put a finer point on this, to take air quality specifically and perhaps even air quality permits in California and LA, for folks who aren't necessarily familiar with this, what are some ways in which the EPA has used its delegated authority, its ability to make decisions under relatively broad provisions of the Clean Air Act and has exercised that flexibility in ways that have been productive, that have led to environmental progress, or that have reduced costs, or have otherwise just been part of this story for how we make environmental progress?

MARY NICHOLS: Well, I could think of a couple of different ways of addressing that question. The first thing that pops to my mind when you raise the question of using delegated authority to do something that Congress may not have thought about or may not have been able to grapple with, I think about the work that we did in the Northeast with the help of the states, with the urging of states with ozone transport. Where you've had this alliance of states that have worked together very effectively now for two decades, really, to control the precursors of smog upwind for the benefit of people downwind and then, negotiations that the EPA presided over and encouraged and nurtured and pushed over a period of years to make that happen.

That was a kind of creative stitching together of regulatory authorities with the help of those who were most affected the states that could have been done, perhaps, through legislation. But it would have been very difficult to have negotiated that out. And there were states that were not happy about it. And eventually, there was litigation over it.

But at the end of the day, the agreement held. And so we've had a situation now for quite a few years where power plants have made a contribution to the control of nitrogen oxides that was beyond what was needed to meet the air standards in their own jurisdiction, but that was necessary to deal with a regional problem caused by the reality of transport. So I think that's a very good, positive example.

Another example which, somewhat ironically, I think, has not been contested is

what happened with the inspection and maintenance program, which is a story unto itself. But there, Congress attempted, basically, because of frustration on the part of some regulators at the federal and state level with their inability to put in place a robust inspection system for in use automobiles, they wrote an extremely prescriptive provision into the 1990 amendments, which turned out to be politically impossible to implement. And during my period there, as Ann alluded to, California was at the head of the line of states that were in rebellion.

Now it turns out that in addition to the politics, which were real, there was also a pretty strong technical argument that California was making. That before this legislation was actually in effect, they had been requiring the use of onboard diagnostic equipment to be placed in new vehicles, which was capable of detecting violations without having to take the cars through an elaborate system, put them up on the dynamometer, et cetera. And so they were making the case that this was unjust and unreasonable and simply wasn't going to work.

At the end of the day-- I'm not going to take any more time-- state by state, we ended up finding ways to work out compromises so that we found states in compliance and did not have to punish anybody for their violations of that provision of the law. But it was a very painstaking process. And it could only have been done if you had a regulatory agency that had both the technical knowledge and the will to keep pushing forward to get the benefits of this program without having to actually apply every single provision of the law as it was written.

MIKE LIVERMORE: This is a great example. Because it's so in the weeds.

MARY NICHOLS: I know. I'm embarrassed to even tell the story.

[LAUGHTER]

ANN CARLSON: Talking about dynamometers.

MIKE LIVERMORE: But this is exactly where progress gets made. And you know you talk about non-delegation. Or folks talk about non-delegation and that Congress should be more prescriptive. But there's these pathologies that can arise out of it. And it can take

years and a lot of work and really in the weeds to fix those things.

ANN CARLSON: Michael, can I jump in with a couple of examples, too? So just to extend Mary's ozone transport example, so in addition to EPA playing a really key role in helping states who already have relationships work regionally to solve what was a regional problem, not an individual state problem, EPA also was crucial in allowing for the development of a cap and trade program to regulate ozone pollution. And it's been extraordinarily successful. I know cap and trade can get dumped on. But the extension of the original ozone transfer commission to, really, half the country now in controlling NOx and other emissions has been really extraordinary and really because of the combination of state cooperation and federal leadership.

Let me give you one historical example. So when the Clean Air Act passed in 1970, one of its provisions required tailpipe emissions from automobiles to be cut by 90% in a very, very short period of time. And William Ruckelshaus, the late and great William Ruckelshaus was the administrator of the EPA at the time, and he really put the auto companies collective feet to the fire, if that's the right expression.

The car companies claimed the technology didn't exist to meet those standards. But actually embarked, along with some other companies, in a very extensive R&D program to develop the catalytic converter. But at the same time, they sued Ruckelshaus and sought an extension of the deadline to meet the 90% cut standard.

Ruckelshaus lost in court. So if you have an environmental case book, you'll read that case, potentially. But he did something that people don't pay very much attention to.

And that is that California wanted to be the guinea pig. So at the time that the auto manufacturers are getting the federal government to extend the deadline, California comes in with a waiver request. Saying, let us come close to meeting the standards. To do that, we're going to require, essentially, the outfitting of all new cars to have catalytic converters on them, something auto manufacturers said they weren't ready for, couldn't do, there were going to be all sorts of problems.

And Ruckelshaus did not cave in to extraordinary pressure to deny the California waiver. Instead, he granted it. And California then went forward. Lo and behold, the

catalytic converter worked. It's probably the greatest environmental invention ever.

And it was a great use of the federal government leveraging power. California being willing, right, and being a leader, but the federal government being there to take advantage of this interesting kind of structural dynamic that showed the rest of the country that catalytic technology in fact worked and now it's standard on cars around the world. Led to, in part-- probably eased the banning of leaded gasoline, because catalytic converters couldn't use leaded gasoline. And Ruckelshaus also required gas stations to provide unleaded gasoline. So, again, these kind of interesting structural arrangements that the Clean Air Act brilliantly included, whether it was intentional or not, can be used by very effective administrators and regulators, I think, to play different interests off each other and so forth.

MIKE LIVERMORE: That's a great example. So just to take another audience question, takes us in a slightly different direction. But the idea behind the question is that there's obviously a very close link between air quality improvements and climate change.

And there's two. There's the co-benefits of reducing fossil fuel consumption, which reduce greenhouse gas emissions as well as local air pollutants. But then, Ann, you also mentioned the ways that climate change are exacerbating air quality problems with respect to ozone and then fires and so on.

And so one question, I think, is a little bit about the politics of climate change. And the question is whether we ought to be accentuating these kind of local, immediate air quality benefits associated with greenhouse gas emissions, reduction policies, and the like as a way of kind of building and maintaining political support for actions that ultimately are beneficial for climate change, but also for local air quality. So that's a question I'm wondering if either one of you or both have reactions to that.

MARY NICHOLS: My reaction is, yes, of course. In any kind of political situation, you have to meet people where they are. And if there is one thing that people understand, it is that local air pollution affects their health. There is also a growing movement in the direction, as we've seen this past summer, of recognizing that environmental protection and health are better in some places than they are in others and that communities of color, low income communities are really disproportionately

impacted not only by pollution, but also by the pandemic that we are still in the midst of with COVID-19.

So these issues are connected to each other, as is the discussion about a recovery. And I think that we're going to see this really coming to a head when we finally get to address the issue of how to rebuild our economy. It will be a discussion I think that will feature a great deal of emphasis, whatever terminologies people choose to use, whether it's Build Back Better or Green New Deal or something yet not invented in terms of slogans. But regardless of the slogan, the policies are going to be looking at ways you can borrow, at now practically free money levels of interest, to invest in communities and do it in ways that will both benefit local health and also deal with the greenhouse gas emissions at the same time and do it in a way that's more equitable than what we've done in the past.

ANN CARLSON: Couple of additions. So California, maybe 10 years ago, Mary will probably know the year, had an initiative-- this was during the last Great Recession-- had an initiative on the ballot to essentially repeal AB32. It was tied to unemployment rates and so forth. And the opponents of the initiative, who were in favor of climate change regulation, ran a campaign that pretty much never mentioned climate change. The entire campaign was based on health benefits and cleaner air.

So it's just interesting. I mean, I think today, because the effects on the ground are more felt, it's easier to talk about the health consequences of climate change. But at that time, they still felt a little hypothetical. And so the air quality benefits were really, really important.

I think the other place where we see this is in cost benefit analysis, [INAUDIBLE] you've written a ton about. The co-benefits, or multiple benefits, whatever you want to call them, of regulating greenhouse gas emissions can be justified financially in part by huge benefits and reductions in particular pollutants, for example. So I think tying it together is smart and key and good politics and also makes a lot of economic sense. And I'm sure we'll see more of it.

MIKE LIVERMORE: Great. Yes. Once you have that confluence, it's hard to say no. So, again, changing gears a little bit, thinking about the role of technology and government at multiple levels and in promoting technology. And I guess we have a moment, as you both

mentioned, given the kind of economic realities, that there will likely be a substantial amount of public investment happening at the federal level. Some of that might be directed through states or through localities.

So I guess the question very generally is in light of that investment, but also more generally, what roles do states or localities have in this technology forcing or technology promoting role? So Ann, you mentioned catalytic converters, a huge important technology. California's played a major role in improving automobile fuel efficiency over the years. But just more generally, do you think that that's a particular place where states and localities have some value? And if so, maybe what could we anticipate in the coming years?

MARY NICHOLS: We're in a period of tremendous enthusiasm and innovation around electrification, with 40% of the emissions in California and maybe closer to 30 in some other parts of the country coming from our transportation system. We see that in order to tackle the problem of climate change, we are going to have to make really big inroads and do it pretty quickly. And the good news is that the manufacturers of the vehicles, including, and I want to stress this, not just passenger cars and exciting electric cool cars, but also trucks and heavy equipment are looking at ways to get to zero emissions using batteries or fuel cell technology. The manufacturers are committed to this because they believe it's where their future lies.

The suppliers of fuel, in this case, the hydrogen or electricity are committed to this future. And what they need are some policy boosts and some financial assistance, in many cases, to make the necessary changes in infrastructure, primarily. You can provide, you can offer exciting electric vehicles. But if people don't see them out there, and they don't know where they're going to be able to charge them, this is going to be a harder sell than if there's a combined effort to roll out charging and how the vehicles available at the same time and a unified message coming in.

Not everybody is 100% onboard. The oil and gas industries are still pretty much trying to run PR campaigns to show that terrible things will happen if we don't let them keep doing business the way they are doing right now. But I think they've already lost the battle in the court of public opinion.

ANN CARLSON: So two other places where we might see states and localities pushing the

technology is in purchasing power. So I think fleets and so forth, local governments can buy electric vehicles or hybrid vehicles. They can do a lot with LED bulbs and that sort of thing, showing that there's demand. States can do the same. And so that's just one place where I think pushing uniformly is possible. Although, of course, the finances of localities right now are really dire.

One other place to give California a shout out, and that is a really obscure part of our pollution problem, but actually it turns out a really big part of our pollution problem are what we call small, off-road engines, or the acronym is SORE. I'm forgetting the "R." It's about the lawn mowers, leaf blowers, chainsaws, et cetera. It turns out that around now, 2020, 2021, those engines are actually going to pollute more than passenger automobiles do in the state of California. And that's in part because California's regulated cars so intensively. And it's been a bit harder on the kind of lawn equipment side.

And of course, we have a lot of lawns in California and they need cutting year around. And we don't like to use water because we have droughts. So we have leaf blowers and all sorts of things. And CARB is now in the business of really trying to push for fully electric SORE equipment.

It's pretty easy now to get electric kind of resident stuff if you're an amateur gardener. It's still harder to get a really powerful electric leaf blower or a lawnmower if you're a commercial gardener. But we're pushing in that direction.

That's all state regulation. It's because of California's special power. But it's coming at the state level, not at federal. And it's really important, even though most people pay no attention to it except for the sound of leaf blowers.

MARY NICHOLS: Just on that example, if I could just jump in? One of the things that happened with the gardening equipment, after there was a big backlash on the part of professional gardening services, is that local air districts began to run buyback programs. Where they took public money, relatively small amounts, but still it was public dollars that they used to offer people a cash incentive to turn in old polluting equipment to buy new clean equipment.

These programs helped to demonstrate that you could make progress towards attainment of the air quality standards. So it was important from the regulator's

point of view. And they were tremendously popular.

MIKE LIVERMORE: And an example of how you just have to get into the weeds, sometimes--

[LAUGHTER]

--to address environmental problems. So we're running towards the end of our time together. But I wanted to ask one-- maybe it's kind of a lightning question before we wrap up. So this just has to do with how interest groups' positions have changed over the years.

So Mary, you mentioned automobile companies weren't necessarily cheerleaders for improvements in fuel economy or making a transition and have come around, or at least some of them have come around. And I'm just wondering if, either locally in LA, or more broadly, where you've seen prior opponents see the light and come around and become active participants in achieving environmental improvements?

MARY NICHOLS: Well, I'll just cite one example. And that is the corn ethanol industry, which has sued California repeatedly over our low carbon fuel standards, alleging that they were going to discriminate against out-of-state growers and manufacturers of alcohol fuels. This is a battle that went on for decades. And you know, we're still having problems at the national level with the renewable fuels standard and debates about it its merits completely. But they have now become convinced that our approach, which was not to specify the technology, but to set up a program where there were lifecycle evaluations for all kinds of alternative fuels and credit given, based on their being able to demonstrate how much better they were than a baseline of petroleum, actually has worked to build that industry and build demand for their product in California. And so they have, indeed, become allies and fans of the program.

ANN CARLSON: The green tech industry in California's been pretty instrumental too in defeating bad ballot initiatives and so forth. I don't know. Mary would know far better than I do. But it feels to me, at least, as an observer that the support of the green tech industry has been pretty instrumental in pushing California climate policy and being a counterweight to oil and gas [INAUDIBLE].

MARY NICHOLS: We've created a whole economic ecosystem here around green technology because of our strong standards. And that has not gone unnoticed by other states and other countries, that you can actually do well and do good at the same time.

MIKE LIVERMORE: Well, if there's any lesson that we can learn from California's experience, I think that is a good one. So thanks so much, Mary and Ann for joining us today. This has been a very productive conversation and an illuminating conversation. And it even has left us with a little bit of hope. So I think that's a good thing.

So, again, thanks very much. And I guess we'll wrap up. Thanks to all of our participants.

Thank you for your questions. We unfortunately couldn't get to all the questions. But I think we get some good answers. So I hope everyone enjoys the rest of their evening.