Last Call for Gasoline

https://www.climateone.org/audio/last-call-gasoline
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Greg Dalton: This is Climate One. I'm Greg Dalton. On today's program - electrifying the world's cars.

Emily Castor Warren: *At this point the writing is on the wall for the end of the combustion engine vehicle and it's a matter of time. [:08]*

California Governor Gavin Newsom has announced a ban on sales of new gas-powered vehicles by 2035. It's an ambitious deadline - and one that the UK's Boris Johnson hopes to beat.

Colin McKerracher: *2030 is just over nine years away...certainly, governments are sending very clear signals right now to automakers that...this is where we're going, this is the direction of traffic. [:09]*

Greg Dalton: And President Xi Jinping has pledged that China will become carbon neutral by 2060. Electrifying the nation's over 200 million vehicles is a big part of that plan.

Hui He: *We see that electrification of transportation sectors will be the single most powerful tool to reduce transportation carbon emissions in the long term. [:11]*

Greg Dalton: Last call for gasoline. Up next on Climate One.

Greg Dalton: Is this the end of the road for the internal combustion engine?

Climate One conversations feature all aspects of the climate emergency: the individual and the systemic, the exciting and the scary. I'm Greg Dalton.

Transportation is America's biggest source of carbon pollution and essentially anywhere you live a car that runs on electricity is cleaner than one that runs on gasoline or diesel. In today's conversation, we plug into the accelerating transition to EVs and what it means for car owners,

carmakers, our climate and our communities. We also explore what policies the Biden Administration can put forward to support the switch.

Climate One's Andrew Stelzer gets us going.

After taxpayers bailed out General Motors and Chrysler during the Great Recession, President Obama had a lot of leverage over the US auto industry. The result was increasing fuel efficiency standards for the first time in decades.

ACT-Obama TRT: 25

"this restructuring, as painful as it will be in the short term, will mark not an end, but a new beginning for a great American industry -- an auto industry that is once more out-competing the world; a 21st century auto industry that is creating new jobs, unleashing new prosperity, and manufacturing the fuel-efficient cars and trucks that will carry us towards an energy-independent future. "

Obama eventually set a goal of 54 miles per gallon by 2025. And car companies made steady progress towards that number. Then came President Trump, who not only scaled back the goals, but took aim at California's legal right to set stricter requirements that are often adopted by other states and effectively become the national standard. Since he took office, California has sued the Trump Administration more than 100 times over climate, immigration and other issues.

TRUMP SUES CALIFORNIA NEWS CLIPS

CLIP FROM PBS TRT: 23

"California's Attorney General Xavier Becerra, vowed that some 20 states are ready to fight back in court. Becerra said the Trump administration plan would dramatically increase carbon emissions, and gas prices.

BECERRA: Who pays for this reckless action by the Trump administration? We do. At the pump, and with our health."

The auto industry was torn. GM and Toyota were among 10 companies supporting Trump's call for lower, uniform federal fuel standards. Ford, Honda, Volkswagen and BMW signed a deal with California to voluntarily stick with the states' higher targets. The legal tug of war continued.

NEWS CLIP-CNBC TRT: 16

"The Department of Justice is launching a new investigation into 4 automakers. Phil Lebeau with the details—Phil.

Sarah, this is a fuel fight between the Trump Administration, the state of California and caught in the middle are automakers, 4 of whom have already agreed to new standards with the state of Calfornia."

But while Washington and Sacramento were busy wrestling over numbers, countries like France, India and the UK have been taking steps to phase out gasoline powered vehicles all together. California governor Gavin Newsom signed an executive order to do the same by 2035. And Mercedes parent company Daimler says it will no longer develop new internal combustion engines.

ACT-News clip: :24 TRT:11

"Mercedes said its current focus is on battery electric mobility, but there's also room and need to work on other solutions, for example, the fuel cell or other e-fuels."

EVs are coming. The question is whether they will arrive fast enough to meet our climate goals.

For Climate One, I'm Andrew Stelzer

[END SOT]

Greg Dalton:

Joining me now are three industry experts. Craig Scott is Group Manager at Toyota North America. Katie Sloan is Electrification and customer service governance executive at Southern California Edison and a board member at CalStart, a clean transportation group. And Emily Castor Warren is Senior Policy Advisor for Nelson\Nygaard Consulting Associates, who specialize in holistic transportation solutions. This program is underwritten by ClimateWorks Foundation. Full disclosure, Ford Motor Company is also an underwriter of Climate One.

As we heard earlier, California will require all new cars sold in the state to be zero-emission by the year 2035. But does Emily Castor Warren think that's possible?

PROGRAM PART 1

Emily Castor Warren: I think so we can do it. The technology is there and we're starting to see a really rapidly increasing pace of consumer adoption. So, at this point the writing is on the wall for the end of the combustion engine vehicle and it's a matter of time. We have the fundamentals of what we need and it's a matter of going from the early adopters to scale.

Greg Dalton: Right. And so, what is needed though, is that gonna happen by the industry's own pace or what kind of other pressures are gonna make that change happen fast enough to meet the climate goals.

Emily Castor Warren: We have seen a lot of improvement in the offerings coming out from industry in the last few years, but I think the overriding policy architecture is also incredibly important. And when we see action from governments like California or from quite kind of leadership we may be able to see in the new administration at the federal level, it's essential to direct the incentives of the companies toward prioritizing the marketing of the products that do have the potential to help meet these goals. Because left to their own devices I think consumers don't necessarily have the familiarity with or the education about these new cars to choose them, if the companies aren't properly incentivized to really put those at the forefront.

Greg Dalton: Right. So initially, electric cars were either early adopters the Tesla owners and now we have pickup trucks and all sorts of cars in different market segments matching really where the SUVs where the market is, is that what you're saying Emily?

Emily Castor Warren: That's right. And I certainly can't blame any consumers for not having chosen some of the earliest waves of electric cars. I owned one myself starting in 2014 that only had about 90 miles of range. And I have to tell you it was hard. I was very motivated to own that car and make it work but someone who didn't already have that motivation I think would have struggled to really have that car meet their needs, because it was hard to go on road trips, you know, it didn't have all of the functionality that someone might've expected. And also, a lot of those early models were small; they were compact vehicles and didn't have the full range of form factors that you might be able to find in the rest of the car market.

So now it's super encouraging to see manufacturers bringing to market electric cars that are in all those segments SUVs, crossovers, even pickup truck starting to come now online with battery electric technology and that's exciting because then we can really imagine a full range of consumers and all of their different needs finding options that work for them.

Greg Dalton: Katie Sloan.

Katie Sloan: Yeah, I just wanted to build on that and say it's really important for to get to scale for customers not just that are affluent, but some of our less advantaged customers to be able to adopt electric vehicles. And I think what's really important to think about there is that a lot of times when people are buying their new car, it's because their current car has broken down. So that's a really difficult time to be able to educate people on electric vehicles. So that's why we need to be doing that continuously upfront so that when they unfortunately have a car breaking down there's options for them and they're comfortable at that point.

Greg Dalton: Craig Scott, Toyota sided with the Trump administration challenging California's right to set stronger greenhouse gas emissions and fuel economy standards. What's Toyota's stance now on California's new plan to allow only emission free cars in just nine years?

Craig Scott: Good question. So, I'll start by saying, you know, the best part of my job is I get to and for 20 years I worked on the emission technology for Toyota. The second-best part of my job is I'm not a policy guy. So, I don't have to make those strategy decisions. I will say this, that from my point of view as somebody who's been doing this for a long time, our position in Toyota is very much aligned with what the goals of California are. We have very similar sustainability goals we have very similar zero-emission goals. We set our zero-emission targets not only for tailpipe emissions but also manufacturing of those vehicles six years ago, to 2050 and 2030 most recently and pulling ahead some of those 2025. So, I think we're quite well aligned.

Greg Dalton: Katie Sloan, are electric utilities ready for a surge of cars with plugs? Can the grid handle it?

Katie Sloan: Short answer there is yes. What's really good about the goals like we are just talking about in California is that they're in 2035. So, that gives us time right now to build out the grid to have the electricity and the infrastructure that we need. At Southern California Edison we have been working on electric vehicles since the 1980s. And just in the last four years we've gone from $22 million for electric vehicle infrastructure programs for customers to over $800 million. It will be deploying over the next five years. So, it's a really exciting time we've been ahead of it but we know we have ways to go and that's why we can all align with these policy targets to get where we need to be.

Greg Dalton: One of the things that came out of "dieselgate", Katie Sloan, was VW got caught cheating on its emissions big global scandal. Billions and billions of dollars on penalties for VW. But one of the things that came out of that is California made them put in a charging infrastructure across the country. How big a deal is that? Is that gonna perhaps the "dieselgate" is actually gonna turn into a really good thing for electrification

Katie Sloan: Well, we've been working a lot with Electrify America, the organization that was set up to put in that infrastructure across the country. And it's been a really great experience to work with them to make sure that we have streamlined processes so that they can put those installations, and quickly, and to share some of those lessons learned with other utilities across the country. I think the other exciting thing that came from that settlement was funding for school buses. So, we're seeing a lot of electric school buses coming online in places that aren't California, including

Virginia. They have quite a bit of school buses that they're electrifying there. So, I think it is a story of making some positive out of a difficult situation.

Greg Dalton: Craig Scott, one secret of the car industry is the dealers make more money servicing cars than selling them. EVs don't need tune-up, spark plugs, oil changes, there's a lot fewer moving parts in an electric car. Are auto dealers and fix-it shops resisting the shift to electric cars because that threatens their revenue?

Craig Scott: That's a good question. I don't think so because there's still lots of things that can be done for service and also dealers are moving into other areas. So, for example, there's dealers talking about installing charging stations the dealer is talking about installing hydrogen stations. So, I think it's a shift of a business model but not necessarily an effort to stop the old – and like everything, Greg, everything is a transition time, right. So, things aren't binary we don't wake up one morning and the whole world is ZEVs, right, we transition over time.

Greg Dalton: Zero-emission vehicle. Emily Castor Warren, how do you see that,the evolution of the industry and the service models business models of, you know, the industry they're called stores pushing metal?

Emily Castor Warren: Sure. Well, I think we're in the middle of a transition not only to electrification but also on a slightly longer time horizon to automation. And there are a lot of interesting implications of that shift for urban form and the way we use public space in cities, and private space frankly. So whereas we may have had a lot of space used for parking lots or for servicing personally owned vehicles in the past I think there is an understanding that as we shift toward automated vehicles that many of them will be operated through fleets and that they will require service they'll require maintenance they'll require charging and there will need to be places that are located proximate to where trips are happening. Near jobs near services where that kind of logistics network can be housed. So, I actually could imagine a future for dealers where they can play a part in that network. It's simply a matter of being proactive because new businesses will arise to meet those logistics needs and it's incumbent on the industry to find their place in that quickly before they get left by the wayside.

Greg Dalton: Katie Sloan, your thoughts on how the cities and the business models are gonna look different in this push to electrify everything to address climate change.

Katie Sloan: There's a lot of devil in the detail here where we can have these very ambitious policy goals. But then we really need to get into the tactical of how do we make this happen.

One of my favorite examples is the city of Los Angeles has already passed building codes, where new construction where they have indoor parking. The floors actually have to be flat because they know that they won't need parking spaces as much in the future and then they'll be able to transform that space into living space or retail space. So, having those kinds of streamlined permitting process future proofing, our building is really where we need to go with cities.

Greg Dalton: And Katie Sloan, it's also that some of the energy companies are getting in each other's lanes, you know, electric utilities are getting into the mobility business which has been the domain of oil companies and oil companies some of them Shell in particular might be getting into electricity. So how are the giant energy industries kind of tangling with each other these days, and kind of eyeing each other's lunch?

Katie Sloan: Yeah, it'll will be really interesting to see how the next 5 to 10 years play out on that front. One of the terms that I really liked about what's going on right now is a lot of coopetition. So

we have to cooperate to help move things forward but at the end of the day people also need to do what's good for their business. So, I think in the near term, as we're scaling up, you'll see more of that cooperation. And then as people really find their groove the competition may come out more.

Greg Dalton: Emily Castor Warren, how do you see the auto industry, risks and opportunities for an accelerated shift to zero-emission vehicles is it in the financial interests of carmakers to go all in on getting off of oil when they've got so much invested, that's the engineering they know they've got these huge plants and factories. Are they really financially incentivized to move away from that?

Emily Castor Warren: In the long-term I see no reason why the auto industry can't thrive in selling vehicles that have this new type of powertrain. It is simply the transition that's painful because when you're embedded in a particular way of building cars and you're confident in the trajectory of your business using that existing technology, it's scary and there can be transitional costs. But in the long arc of things there's no reason why folks can't successfully sell these electric cars. In fact, consumers once they have the experience of using electric cars love them and find them to be better. And I think will continue to be attracted to the companies that offer great electric car product offerings for many years to come.

Of course we did also talk about this shift toward automation and the fact that there may be some transition in transportation behavior generally where people start to buy rides instead of buying cars, but I think that will happen much more quickly in dense urban areas rather than in some of the more suburban or ex-urban and rural areas of the country where I imagine car ownership will persist for a very long time. So, there's nothing like a cliff coming up for carmakers when it comes to selling cars to people and they can also look to a future of selling to fleets.

Greg Dalton: Craig Scott, in 2004, California Gov. Arnold Schwarzenegger announced plans for a hydrogen highway and he loved to talk about his hydrogen powered Hummer. That highway went nowhere and Hummer just announced a battery electric version of the iconic tough guy car. Despite industry consolidation around battery electric cars, Toyota is sticking with hydrogen. One analyst said that we'll know Toyota is serious about hydrogen when it pays for bills of fueling network for its hydrogen cars similar to what Tesla has done for battery electric cars. Why doesn't Toyota do for hydrogen what Tesla has done for EVs?

Craig Scott: So, I think we've done for hydrogen far more than any other manufacturer has done for any of their competing technologies to be frank. We spent lots and lots of R&D money on building vehicles. And those are not just fuel cell vehicles but also electric vehicles, you know, for other markets. Good to remember that we still have more cars with batteries in them either in hybrid or plug in form than any other manufacturer and maybe all manufacturers combined. So, we don't build gasoline stations, we don't build roads for cars, that's the domain of other people. We do support, you know, a hydrogen network in California, to the extent possible and other parts of the world. But, you know, it's a big aspect I think Emily made a good point that it's transition and everyone should take their sort of proper role in that.

Greg Dalton: And would you agree that policy is helpful to move that transition faster than companies would otherwise go themselves?

Craig Scott: I mean policy is absolutely fundamental to making things move right and not just on the manufacturers side but also on the consumer side, right. So, customers have to be incentivized to purchase vehicles that are inherently more expensive to sell and build than the incumbent technology and that's just, you know, the nature of the game, right. So, it's building something new is always more expensive than building, something you've been building for a hundred years.

Greg Dalton: You're listening to a Climate One conversation about the road to an all-electric future. Coming up, can we get there fast enough?

Katie Sloan: *I think what can make it go faster is continued policies that will help push us together….We're on a really good trajectory in California, but I think that that also needs to be replicated across the U.S…so, let's see how much further and faster we can go in a new administration. [:18]*

Greg Dalton: That's up next, when Climate One continues.

Greg Dalton: This is Climate One. I'm Greg Dalton. We're talking about electrifying America's drivers, with Katie Sloan of Southern California Edison, Craig Scott of Toyota North America and Emily Castor Warren of Nelson\Nygaard Consulting Associates.

Greg Dalton: When people think of electric cars, one name usually comes to mind. Tesla dominates the U.S. electric vehicle market, at around eighty percent of sales this year, while the rest of the automakers fight over what's left of the pie. Sure, they've been at it longer than the others, but what's the real secret to Tesla's success? Emily Castor Warren says it comes down to understanding the thrill of the open road..

PROGRAM PART 2

Emily Castor Warren: They really saw that in order to make the electric car market grow they needed to sell cars that people found aspirational. That they really wanted to have, that were beautiful high-performing cars. And I think it's taken a very long time for other car owners to rise to that same challenge and learn that same lesson rather than simply viewing the requirements to manufacture electric cars as something they have to do. I think the mindset that will be successful in this market is selling electric cars that people would love to have.

Craig Scott: I think that's a really good point. Aspirational vehicle sales are really key. I think all manufacturers really have been doing this for a long time. That's why Toyota has Lexus and Honda has Acura and so on and so forth. This is very sort of typical sort of way to sell cars, I think. The issue really that I think will be important for us to move this to a mainstream technology which is really the key to make any of these things really meaningful, right, I think we can all agree that selling a few hundred thousand cars is pointless in a 17 million car market if we're talking about the U.S. And that is, you know, the cost of which these vehicles transact, right. And so, selling a hundred-thousand-dollar car is really, you know, a nice thing for manufacturers to do but we need to hit the heart of the market which, you know, is really around $27,000. So, selling cars into that price point is where you start making actual impacts to climate.

So, you know, folks buying cars in the inner cities are buying things that they can afford and they can afford to refuel, right, and that's really important. We can't leave those people behind.

Greg Dalton: Right. But I think Emily touched on something which is, you know, initially environmentally oriented cars and the Prius is an example of this were sold on virtue. Electric cars haven't been sold on sexiness and performance and other things it's been kind of the, you know, eat your vegetables kind of virtue cars. And Tesla comes along and it's like all about shine and polish. So to your point on auto companies have really marketed these cars on virtue and that's not where most of the market is.

Craig Scott: So, I don't think that we're saying that we're marketing vehicles on virtue, I don't think that's the case. Our core DNA is quality, dependability and reliability not virtuousness. So, it's not the case. I think that again, it's a really, really key point to note that most people are buying cars I think our case in this earlier, you know, we are placing a car that is no longer working or you need another car in the household, right. These are cars that are utility cars for people to get from point A to point B, right. And the data shows very clearly that most people who are buying electric cars are buying them as a second or third car today. About 33% of the time you're buying it as your primary vehicle. If you compare that to hydrogen for example just to say kind of how that is playing out, roughly about 94% of people buying at Toyota are buying it as the replacement for their primary vehicle. That means that they view it as a technology that can be used in their daily lives.

Greg Dalton: Emily Castor Warren. Ride hailing companies, Uber and Lyft claims they would cut greenhouse gases by reducing car ownership and promoting shared rides. We now know the data shows that those companies increase stress of traffic congestion in total vehicle miles traveled. Drivers travel long distance in the urban centers and spent a lot of their time deadheading driving around empty, waiting for our twitchy fingers to summon them. How do they figure into the electrification of cars as part of America's climate goals?

Emily Castor Warren: We've seen a lot of great progress in the last few years and even just the last six months from Uber and Lyft with respect to their commitments to electrification, whereas for the prior several years of their existence they have been really relying on the fleets of personally owned vehicles that are out there very few of which are currently electric cars. They've now expressed a commitment to taking a more proactive role in controlling what types of cars are allowed on their platform when it comes to their emissions profile. They've both made commitments that they will actually make sure that all the cars on their platforms by 2030, are electric and that's huge. That would mean that they'd be miles ahead of the personally owned vehicle fleet that's out there at that same year. Because even if people start being able to buy combustion engine vehicles in California by that year or, you know, quickly following year there will still be lots of combustion engine vehicles that people own and will be driving for many years after that because the average car is on the road after it's sold for 10 or 15 years. So, if we actually see fully zero-emissions fleets operating on Lyft and Uber platforms by 2030 that will make them really one of the most sustainable modes of transportation that's out there from the emissions perspective. Obviously it's still great to walk, bike and take transit and we hope that that's a big part of the picture, but as zero-emissions options like Uber and Lyft can really support a car free or car light lifestyle and offer a very important accelerator to the broader electric vehicle market by getting large numbers of people to have the opportunity to take rides in electric cars. And also, many, many drivers, including perhaps low-income drivers, drivers who may come from disadvantaged communities and not otherwise have access to electric vehicles to get that experience as well.

Greg Dalton: Craig Scott, where does electrifying public transportation buses, heavy-duty vehicles, long-haul vehicles fill into this picture? We're talking a lot about electric cars, but there's a lot of other vehicles that move around; buses, trucks, etc. how does that fit into the electrification picture

Craig Scott: There are indeed and I would echo what Emily said, it's really true that people getting experience today with a zero emission vehicle it really helps them change their position on it. And we did some really fundamental research in the space with Berkeley probably 10 years ago now that showed it to be the case. And the same is true then for public transportation, right. So, people who get an opportunity to ride an electric bus or a fuel cell bus get the experience that they otherwise wouldn't have gotten and understand that, you know, these technologies are real and they exist and they're in the marketplace for people to try and to evaluate. So, whether it's, you know, a Corolla hybrid or a fuel cell bus in Orange County or a fuel cell class A truck that we're running in Port of LA, all these things are important I think to deepen the message with consumers.

Greg Dalton: Katie Sloan, environmental justice advocates say that affluent people are pushing cost of their solar roofs to electric cars on to lower-income people. How big a problem is that?

Katie Sloan: I'm glad we went into this and I'd like to bring it back to that conversation around medium and heavy-duty vehicles. One of the things we found in Southern California is that medium and heavy-duty vehicles are causing 80% of the particulate pollution and that is right around disadvantaged communities. So, in Los Angeles we have some of the largest ports in the country 40% of our products come in through Los Angeles Port of Los Angeles and Port of Long Beach and they travel along our freeways into the inland Empire where the warehouses are. And so, really cleaning up the trucks that are going along those freeways is critical.

So that's why we partnered with a lot of environmental justice organizations for our programs for medium and heavy-duty infrastructure investments. So much so that when we were at a regulator looking to get those programs approved. We had environmental justice advocates advocating that we get more funding to do that. So, that's why we've actually been pushing some of the medium and heavy-duty vehicle electrification faster than some of our light-duty programs because it's really critical that we clean up the air pollution in those communities. So, I think that's one piece it's really important. The other piece is that even on the light-duty vehicle side. Those vehicles are also traveling through those communities.

Greg Dalton: Emily Castor Warren, you and I own electric cars. We don't pay any gasoline tax, which is the primary way for funding roads and highways in this country. So, we're free riders that's the problem if there's more electric cars. How's that gonna be solved?

Emily Castor Warren: There are actually a lot of studies that are underway across the country in different states looking at new sources of how to structure the revenues that states get to fund transportation infrastructure. California has looked at a road user charge, where instead of charging just for kind of gas taxes they would instead transition over the charging people for miles, because every type of vehicle travels miles regardless of its type of powertrain. And I think that's probably a pretty sensible solution.

Greg Dalton: So, as we wrap up I wanna come back to speed because we know that the climate goals are serious the climate budget is being burned through. So how do we get to speed quickly. How do we get make this transition? Mobility is moving toward electrification cleaner; it's just not happening fast enough. Katie Sloan, what can make this go faster?

Katie Sloan: I think what can make it go faster is continued policies that will help push us together. We know on the solar side for example, we didn't just have one policy that was helping to increase adoption for solar. We had electricity rates that were helpful. We had industry programs. We had targets it's in really in all of the above. So, we're on a really good trajectory in California, but I think that that also needs to be replicated across the U.S. because it's not just the California market, right, that's not what is going to get the manufacturers to be excited about producing these vehicles. So, let's see how much further and faster we can go in a new administration.

Greg Dalton: Emily Castor Warren, pick up on that. What could accelerate the transition to cleaner mobility in the United States?

Emily Castor Warren: Well, certainly, first of all just backing off from the war against all the policies designed to bring electric cars forward will be very helpful and provide long-term clarity to the industry. So, there is not ambiguity about what the standards are gonna be and what direction we're headed. I'd also love to see renewal and expansion of the purchase incentive programs that have been a holding pattern the last few years. And of course, infrastructure continues to be really

important. So, I think looking at an additional infrastructure and the pace at which we can install that across the country not just in the places that have been the biggest centers for purchasing electric cars to date is going to be really important as well. And to have close partnership with states that are doing things that are leading the way, like California where they are really motivating manufacturers to exercise this transition over to electric cars rather than seeing it as a sideshow to their main business

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Greg Dalton: You're listening to a Climate One conversation about transitioning to zero-emission vehicles. That was Emily Castor Warren, Senior Policy Advisor for Nelson\Nygaard Consulting Associates. We also spoke with Craig Scott, Group Manager at Toyota North America and Katie Sloan, with Southern California Edison.

Next we look beyond America's shores at the global EV market. Worldwide EV sales have dropped around fifteen percent during the covid recession, but one region is experiencing a power surge. Europeans have purchased four hundred thousand plug-in cars this year, a significant increase over previous years. To tell us more we are joined now by Hui He, China Regional Director for the International Council on Clean Transportation. Colin McKerracher is Head of Transport analysis at BloombergNEF. He starts us off from London.

Colin McKerracher: So, you've got a really unique combination of factors all coming into play in Europe at once. The first one is a regulatory push. So, what's happening is that automakers have to hit a certain fuel economy target. So, it's framed in terms of grams of CO2 per kilometer driven of all the vehicles that they sell. And if they don't, they have to pay very significant fines in the order of billions of dollars if a lot of them miss it. So, what that means is that over the last years a lot of them have been waiting with their EV models to really launch them in 2020 to get the most regulatory benefit from that. So, there's that big regulatory part of it.

Then there's this sort of model choice part of it that's related that a lot of consumers can now pick a model in different segments in different price points with more options than there were a few years ago. And then in some markets, you're actually starting to get to much more the real middle-market. So in parts of Northern Europe, Norway, Sweden, the Netherlands you're starting to get into the steeper part of the curve. So, all those factors together mean this is definitely gonna be a record year for EV sales in Europe and 2021 will be even higher still.

Greg Dalton: So, there's more choices, lower prices and sounds like the market maturing. BloombergNEF forecasts about 28% of global sales in 2030 will be electric, 58% in 2040. But Boris Johnson and UK recently announced plans to ban all gasoline cars by 2030, five years earlier than previously announced. How big an impact is that gonna have? UK not a big market, but symbolically?

Colin McKerracher: Yeah, I mean, it's not a big market in comparison to the U.S. but it's still one of the top 10 auto markets in the world. Those are big numbers and that's a really close date. And I would just day when we do our forecast, we don't assume any new big policies like that are gonna come in. If they do come in, then the adoption forecast will be higher the next time we come back to it. So, I suspect it will be higher given all the stimulus money. And when we're talking about what's driving things in Europe, stimulus money is a big part of it too, markets like Germany and France a lot of the COVID recovery packages for the auto sector have been tied to try to push more clean cars on to the road. So that's part of it. And I do think these long-term phaseout targets they're not so long-term anymore. We're not talking about 2040, 2050. 2030 is just over nine years away. I think there has to be a huge push on charging infrastructure, on raw material supply, all these sorts of things to enable that. But certainly, governments are sending very clear signals right now to

automakers that, look, this is the direction we want things to go. We know there are some challenges ahead. We want to work together in solving them, but this is where we're going. This is the direction of traffic.

Greg Dalton: And the leader in that Hui He, the biggest government setting those sorts of signals has been China real leader in EV adoption technology. How has China's EV push been set back by the COVID recession?

Hui He: I'd say that the economic downturn happened in the beginning of 2019. And we have already seen that the EV sales were down starting from mid last year. Not just because of COVID. So, I'd say it's a combination of economic recession starting from the beginning of last year and then this big withdraw of central subsidy play a major role. And then you see the COVID was impacting on top of that, on the entire economy and people's buying patterns into 2020. So, I'd say it's the combination of many things, not just the COVID

Greg Dalton: And a lot of people might question well, electric cars in China doesn't that mean a coal powered car. And is that dirtier perhaps than a gasoline powered car? So, Hui He, is it electric car in China really cleaner than a gasoline car given all the coal they have?

Hui He: That's a good question. Actually, there is no governmental research or number to confirm that the electric vehicles are really cleaner than combustion engine vehicles. However, there are many research institutes beginning to digging into this issue. There are a lot of research tools established and international collaborations on this. According to these independent research results, we see that in the current stage even like more than 60% of the electricity was powered by coal. Electric cars still have marginal benefits, environmental benefits over combustion engines but just marginal. In some cases from a lifecycle perspective, electric vehicles may emit a little higher conventional air pollutants like fine particles than combustion engines. However, that will change dramatically in the next few years as China is doing, they are pushing very hard in cleaning up its coal sector where the upstream emissions. And we already see in this 14th five-year planning the macro central planning for China's entire economy for all the major sectors like energy transportation. China is already releasing a signal to deeply clean up its electricity sector. So, we'll see in about 5 to 10 years, we'll see the grid will become much cleaner and the benefits of electric vehicles will become bigger.

Greg Dalton: Yeah, electric cars get cleaner over time

Colin McKerracher: Yeah, I just want to jump in. Part of the issue too is that when you sell a car when it rolls off the line for an internal combustion engine vehicle you are locking in its efficiency, right? Its efficiency is fix; its emissions are fixed. If anything, they deteriorate over time. The benefit if you're talking about decarbonization of the EV side is that you can sell a car and it can get cleaner over time as you say as the power grid cleans up the emissions cleanup. And I live in the UK, when I moved here coal was about 48% of the generation mix in 2010. This year it's gonna be about 4%. And so those EVs that were bought in 2010 or 2011 are driving much, much cleaner than they were when they're purchased. And when we're talking about long-term goals of decarbonization then you really need to do these things concurrently if you're gonna have any hope of hitting some of those longer-term targets.

Greg Dalton: You're listening to a conversation about the global impact of electric cars on climate change. This is Climate One. Coming up, why Chinese automakers could get a foothold in the European market.

Colin McKerracher: *It is hard to convince people to get into a totally new brand of vehicle. But what we have seen from the past is that people's economic loyalty is often the actually most important thing. So if the vehicle is good value people will get into it regardless of where it came from. [:13]*

Greg Dalton: That's up next, when Climate One continues.

Greg Dalton: This is Climate One. I'm Greg Dalton. We're talking about the global market for zero-emission vehicles. My guests are Hui He of the International Council on Clean Transportation, and Colin McKerracher, transportation analyst at BloombergNEF in London.

Greg Dalton: Even with the increase in electric cars worldwide, we still have a long way to go to meet our climate goals. Big picture, how much greenhouse gas reduction do EV sales account for? Can we really hope to make a dent in the carbon budget?

PROGRAM PART 3

Colin McKerracher: Not yet. The reality is there's still only, well at the end of this year we figured to be about 10 million electric vehicles on the road globally. And those are displacing about 1 million barrels of oil, but actually that's including two wheelers and there's a lot of electric two wheelers mostly in China and most of that displacement is actually from the two wheeled segment. So, if we were saying, which is having the biggest impact today in terms of CO2 emissions it's probably electric two wheelers then electric buses both of those in China and then third, the global passenger electric vehicle fleet.

So, there is an impact today, but the vehicle fleet is so big it takes such a long time for these trends to have an impact because you're impacting new vehicle sales right now new EV sales are going up but there's still 1.2 billion passenger vehicles on the road in the world and it takes a long time for that fleet to turn over.

Greg Dalton: I'm old enough to remember waves in the United States of first the Japanese imports were a big deal then, then Korean imports. Hui He, when are we American consumers going to see Chinese branded electric vehicles driving around? How far are we from a wave of Chinese imported cars?

Hui He: I have seen that car manufacturers in China are working very hard trying to sell vehicles cars in the United States and Europe. Perhaps today they are more successful in selling commercial vehicles, buses. We see a lot of electric bus in Europe are from Chinese brands but not so much on electric cars. Even now domestically, we have this huge brand the BYD, or Beijing Automotive Incorporation, BAIC.

It's a dream of Chinese automakers or the China government seeing that their technologies is really going abroad. Their technologies are competitive. But today they still meet a lot of barriers. Many of the barriers are not understanding the technical requirements standards, especially the environmental standards in the more advanced markets like the United States and Europe. Some cars are struggling to meet their local requirement but the manufacturers are trying their best to improve that.

Greg Dalton: Colin, VW got busted cheating on the emissions scandal, you know, executives there's still legal proceedings billions of dollars in fines, etc. Has VW really changed its stripes and what about the other luxury European car brands are they serious about electrification?

Colin McKerracher: I think they're pretty serious about electrification. I mean, when I talked to VW and the amount of money they're pushing in is just a huge industrial push around this. And when you talk all the way up the management chain there's a real belief that this is the necessary next step for VW to continue be a global brand and to kind of roll with this change in the auto sector over this next 10- and 15-year period. So, I mean $66 billion in investment over the next five years going towards EVs, pretty significant chunks of money impacting all of the VW group brands and each one some of them have different stronger points in different markets within Europe. Right after the emissions scandal happened, I remember saying really clearly like this is they're now my odds-on favorite to really drive the EV revolution in the 2020s. I think that's what's gonna happen. I think you're gonna see a pretty big increase in the numbers from them.

Coming back to actually the Chinese automakers, I think actually Europe might be where there's an interesting market angle for them because there is this quite a bit tighter CO2 standard. And some automakers who are not really ready to hit that and who are looking for partners to help bring down their average CO2 levels. So it is hard to convince people to get into a totally new brand of vehicle but what we have seen from the past is that people's economic loyalty is often the actually most important thing. So if the vehicle is good value people will get into it regardless of where it came from if it's safe and good value. So, there is an interesting window that you may see some of the Chinese automakers try and enter in Europe because there is this kind of regulatory pressure and some of the automakers selling in Europe are not quite able to meet it. So, there might be a window there that they try and get in in the next couple years.

Greg Dalton: So, Europe is ahead on policy reducing greenhouse gases and that's pushing the electrical move to mobility. What about the oil companies? Clearly they're threatened by this European oil companies are more progressive than American oil companies. Colin, are European oil companies fighting this push to reduce demand for their primary product?

Colin McKerracher: Not really. European oil majors are pretty active on e-mobility. So, whether that's Equinor or Total or Shell or BP, all of them have big groups very active in e-mobility. And they've snapped up a lot of the companies around charging infrastructure. So, quite a few of those are actually part of, so whether it's BP Chargemaster was one of the biggest ones in the UK. Shell has brought up a bunch as well and operates a very large number of charging points. So, right now they're supportive. They have divisions that are working quite closely on e-mobility and trying to both as a new business area but also to preserve the existing sort of retail sites that they have. In Europe oil majors own more of the retail sites than they do in the U.S. or North America where they're more franchised.

But this is this kind of classic innovator's dilemma scenario, right how much you really want to self-disrupt and that is not clear yet. That's not clear if it really starts to cut into what is still the core business by a very large, large percentage. How far will you keep pushing that? And I don't think we've tested that yet but you have seen more and more the European oil majors making increasingly aggressive long-term commitments to some version of carbon neutrality. Now whether that includes scope one, scope two, scope three emissions or all these different things is everybody's got a different take on that. But they're all making noises in that direction and putting real money and real activity towards it as well.

Greg Dalton: My guests today are Colin McKerracher, head of transport analysis at BloombergNEF in London and Hui He, China regional director for the International Council on Clean Transportation.

Hui He, Chinese President Xi Jinping has pledged that the country will be carbon neutral by 2060. Pretty ambitious goal. How important is the electrification of cars and mobility to that big climate

goal?

Hui He: Basically, we need to do a bit of analysis into this. This is not a very straightforward to answer, especially China didn't really translate that very high-level economy wide goal into sectoral goals as the Europe did. So, we did some analysis most recently and we see that electrification of transportation sectors will be the single most powerful tool to reduce transportation carbon emissions in the long term. And I said this in the long-term because in the near to midterm you will see a number of actions that China will take sort of to exhaust all the emission reduction potentials of the combustion engines. So close to 2035 you will see like electrification will drive down the majority of carbon emissions in that period of time from 2035 to 2060. That's my short answer.

Greg Dalton: I want to end on technology. Some analysts say that the countries that lead and dominate in electrical technology, battery technology will really be in a strong position in the 21st-century economy. That has seemed to be China, I'd like to know how China, the U.S. and Europe are stacking up on the tech race for batteries and all the technology that is moving away from this hundred-year-old internal combustion engine. Hui He, where is China relative to Europe and the U.S. on the tech race?

Hui He: I'd say China is not lagging too far behind on electric vehicle related technologies. And there are some indicators. But in the past 10 years, if we say one most successful thing that China did to push for vehicle electrification was that China pouring a lot of money to build almost a homegrown supply chain for the electric vehicle batteries. So, from the raw materials that China's well-prepared China owns either directly or indirectly, a lot of the world's reserves for rare metals that is critical for building batteries. And then moving along the supply chain China is acquiring more and more technology its own technology for like battery cell production, battery cell packaging, you need to package all the cells into one pack and make that pack very efficient. China is moving slowly but progressively on that trend. So, I'd say, overall, at least on the supply-chain side China is largely independent but still not quite advanced compared with United States, Japan and Europe.

Greg Dalton: And how much do we know about China's efforts, you know, well documented industrial espionage efforts. People masquerading as graduate students in the United States or elsewhere. Do we know what they're doing to steal this technology that they don't have to close that gap?

Hui He: No. No, through international collaboration the other way to see why China's EV industry was growing so fast was to look at how much international collaboration China has done in the past 10 years with Europe and especially West Germany the Chinese government signed an MOU with the German government in pushing for electric vehicle technology. They are collaborating together to conquer the common technological barriers. Same thing with the United States there's a platform that I know that builds between the Argonne National Lab and the U.S. government basically and the Tsinghua University, a leading university in developing auto technologies in China. They are also collaborating on this technology technological corporation or transfer. At the industry level you will see also the manufacturers are trying to collaborate with or merge with a lot of the international brands trying to co-develop their technologies. And the Chinese government is having an increasingly open up policy to support such trends at least this was what's happening in the past 10 years.

Moving forward, I'm not so sure and there the current international dynamics maybe the international collaboration will slow down and China will have to resort more on its internal resources to continue the technology developments. But at least as in the past international collaboration is a big push for electric vehicle technology development.

Greg Dalton: Colin McKerracher, some analysts say that the country that dominates battery and other electric car technologies will be a real leader in the 21st century. How do you see the tech race between China, Europe and the U.S. playing out?

Colin McKerracher: Yeah, I would throw Japan and Korea into that mix as well, certainly because they've been leaders in battery technology to date. I think there's a difference between supply chain control and fundamental technology development. And going all the way up the supply chain China's much better positioned than everyone else in terms of securing access to lithium or cobalt or a lot of the other materials that are going into the vehicles. But what you're also seeing is that there's a real battle going on right now for the next generation of battery technologies. And that's where I think there's real competition and a wide-open playing field and we just don't know yet. But on the supply-chain side on the raw material supply for the current generation of batteries China definitely has a leg up.

Greg Dalton: You've been listening to Climate One. We've been talking about the role of electric vehicles in meeting global climate goals, with Colin McKerracher, head of transport analysis at BloombergNEF in London, and Hui He, China regional director of International Council on Clean Transportation. This program was generously underwritten by the ClimateWorks Foundation.

Greg Dalton: To hear more Climate One conversations, subscribe to our podcast on Apple Podcasts, Spotify or wherever you get your pods. Please help us get people talking more about climate by telling a friend or giving us a review. It really does help advance the climate conversation.

Greg Dalton: Kelli Pennington directs our audience engagement. Tyler Reed is our producer. Sara-Katherine Coxon is the strategy and content manager. Steve Fox is director of advancement. Anny Celsi edited the program. Our audio team is Mark Kirchner, Arnav Gupta, and Andrew Stelzer. Dr. Gloria Duffy is CEO of The Commonwealth Club of California, where our program originates. I'm Greg Dalton.