We’re all set.

Okay so, thanks Heidi.

So, I’m Robert Dubrow, for those of you who don’t know me.

I’m co-chair of the School of Public Health Sustainability Committee that I co-chair with Heidi.

And this is a very informal gathering to provide the community with information about electric vehicles.

First of all in use they are zero emissions, but secondly, if they’re charged with electricity that’s generated from renewable energy then they’re truly zero emissions, whereby they’re not generating greenhouse gas emissions in any way.

And in fact, most of you have probably heard that the state of California now has a policy that starting in 2035, it will be illegal to sell an internal combustion engine vehicle in California.

So, they all will have to be electric vehicles. Sorry, those are new vehicles. Used vehicles will still be permitted.

So, today we have panelists who own electric vehicles.
The panelists are me, Paul Cleary, Denise Meyer, Dean Stanvermund and I’m looking to see if Cassidy made it. Cassidy said she wasn’t feeling well this morning so she may not have made it. Okay, so I guess there are, we have four panelists. And so, some of the issues you probably wanna hear about are things like, what’s it like to drive? Is it different? How convenient is it? What’s the cost compared to a conventional gasoline powered vehicle? How about maintenance? Issues like that, and so I thought we could start just by going around to the panelists and having you just comment on whatever you think you’d like to say about your experience of driving an electric vehicle. So maybe we could start with Paul Cleary. Okay, those are good, first of all, thanks for organizing this. Those are good topics. I would say the question I get asked most often is the convenience. I own a Tesla and so, the performance is as good or better than any car I’ve ever owned.
So that’s not an issue. But the question comes up, is it a hassle? How convenient is it? My car has about a 270 mile range and I’ve learned that you have to think about it a little, but less and less as charging stations become available. Tesla has supercharging stations and then there’s stations really all over. For example, when I take my car there’s a charging station at the airport which they charge for free. If I go on the train there’s a charging station in the New Haven train station. There’s one at my grocery store, which is Bishop’s. There’s one at the garden center. There’s even one at the local brewery in Bradford. And increasingly there are charging stations throughout the country. So, Tesla is every, almost every month expanding the number of stations and for example, I just checked on my phone before we started, I have like four different apps, the car washes list where the charging stations are. There’s an app called Flex Share, Charge Hub and Connect, all of them if you click on them they’ll tell you where charging stations
I would say I've never had to do much more than just be aware of it except a couple years ago whenever I was skiing in New Hampshire I got sort of on the end of my charge and had a little bit difficulty. But they're adding charge stations in those areas. My neighbor, Erol Frickrick, has driven to the DC area and back without any issues. So, it's really quite convenient. Because of the way the cars are run there's almost no maintenance in my car. You don't have any fluids. You don't have, except for brakes, a lot of the mechanical issues are obviated. So, I've had a couple little things to take care of, like the door sticking and so on. But, there're many fewer maintenance issues and the cost, to be honest, I haven't gone into the sharp pencil part of it. People claim that it is cheaper than electricity. When I lived in Bradford I put in solar panels, so it was, basically I was charging my car from the sun, so I wasn’t using the non-renewable resources that have to use, that are used to run power plants. So I would say on those issues that you raised, the cost is less.
The convenience is, I have to think about it a little bit, but I would say it’s become almost seamless. I plug in the car every night, I get up and I go and I’ve never, with maybe one or two exceptions a couple years ago on long trips, I’ve never had any issues with getting charged. Tesla has this thing called super chargers. So well, I can go to Hartford Airport and back without charging, but if I’m going to go somewhere in New York and it’s a little bit longer and at super charger station I can charge 80% of the car in 20 minutes. I stop, get a cup of coffee or get something to eat, come back out and the car’s charged and ready to go. So I’m just absolutely ecstatic about it and pleased.  
I think it’s very functional. I’ll stop to see if anyone has any questions. Yeah Brian, I have a question. Do you ever find that these charging stations are filled up with other people trying to charge up and you don’t have access to one of ’em? I would say, I would say a year ago I would say that has never happened. As people get interested in it, it has. For example, it used to be you’d go to the train station and you get free charging.
The charging station was down on the ground floor, which was the closest spot and there was never anyone there. Once or twice or three times recently when I've gone to the train station it's been full, which to me is a good thing. On the other hand, the apps will tell you whether or not there're spots available or not. So, it used to be go to a Tesla station and there'd be no cars. Now you go and I would say once or twice I haven't been able to get in and I had to go get a cup of coffee and wait or something.

But it's being compensated for by the proliferation of charging stations.

I have one quick question. Go ahead Brian.

I'm just wondering if like I have always heard about electric cars, and other batteries as well, like over time does the capacity diminish? Like your 270 miles, a year ago was it 290 and then a year from now, will it be 250, or does that not so much happen any more? The answer is certainly yes, with the caveat that we don’t really know. And what I mean by that, one thing I didn’t mention is the capacity goes down dramatically in cold weather.
So, of the times I’ve had the trouble, as I said, I went to New Hampshire skiing and it was nighttime, it was cold, the heater was on and the batteries just don’t perform as well.

So, that’s one factor.

My car has gone down, you know, it used to be, when I got it it was like 274.

Now it’s like 268 or something.

My car is like four or five years old.

But, I don’t think we really know how fast or how far the Tesla batteries deteriorate, but any battery does.

That’s almost certainly going to happen, but I don’t think we have, others may have different experiences, but I’m at like 268 or something.

You can start to see it ebb away, but we don’t know,

if I keep the car 10 years,

we don’t know yet, I don’t think.

Others may have different experiences.

I’d like to chime in, can you hear me?

So, we’ve had a 2000.

I can barely hear you, Stan.

- I’m sorry.

Is that better.

- No, can’t hear you at all.

No, when you had the headphones on we could at least hear you.

- Is that working?
We can barely hear you.

It’s not working.

It’s not working.

No.

It’s getting a little better.

Okay, if you can hear me I’ll just speak up.

Can you hear me okay now?

Yes, much better.

Okay, I’m sorry about that.

I am still trying to figure out this new headphones.

But, we had a 2002 Prius and nobody knew how long the batteries were going to last and I gave that car away this year mostly because it needed a catalytic converter mostly because it needed a catalytic converter and a bunch of other, needed about $1800 worth of non-battery related upgrades and I just, I wanted to buy an electric car, so I gave it to a friend who’s an amateur car repair guy.

So, we had predictions that the most it would last, this battery would be 100,000 miles and when I gave it away it was 130,000 miles. There was a slight diminishing in performance in the car, not so much that I could really notice it, but the folks at the Toyota dealership told me. And I do believe that it’s unknown, just as Paul said, the extent to which these new era
batteries in electric cars, as opposed to hybrid cars, will last, but I have to say, I’m terribly optimistic because all of the predictions of prior era technology since 2002 is a long time ago in the battery field. All of the dire predictions that they would only last five, 10 years were completely wrong. And so, I’m pretty optimistic that this new technology are going to be long acting batteries, shall we say, the EverReady Bunny. I have one comment I think is pertinent to this and then I’d like to turn it over to Denise. So, we decided, we bought our, got our electric vehicle, which is a Chevy Bolt, at the beginning of 2020 and we decided to do a three year lease because the reason is that I’m predicting that battery technology has been improving and I think it’s gonna keep improving. So I didn’t wanna kind of lock in for the longer term. And so, that’s kind of one approach to this. For one thing, in three years I don’t think deterioration of the battery performance is gonna be an issue over just three years. And secondly, my guess, my prediction is that the range is gonna keep improving so that if two or three years from now, the range, the typical range
might be 350 miles instead of 250, let’s say.

So anyway, that was one comment.

So now, let me turn it over to Denise and you can talk about it.

Why don’t you say what kind of car you own and talk about your experience?

So, I came in on more of a budget plan.

I have a 2016 C-Max which was put out by Ford.

I think they’ve discontinued the model.

It is a plug-in hybrid.

So, it’s plug-in electric and gas engine.

So it’s much smaller battery capacity,

but I can go without stops and starts,

I can go 23, 24 miles on pure battery.

If I am doing errands around town

If I am doing errands around town

I’ll get more like 18 ’cause that’s a bigger pull on the battery.

What I discovered is 90% of my driving is very local and so my gas costs went way down.

And I did the math about three years ago,

I’m not entirely sure that I did it right,

but my calculations was it was like 60 cents at that point to charge for 24 miles.

24 miles.

As opposed to, at that time, $3 for a gallon of gas.

So, I also discovered that 90% of my driving is very local, so I buy very little gas.

My charging experiences have not been as rosy as Paul’s.
Yeah lots, there are very few charging stations. When I was carpooling I could get one way on battery, but I couldn’t get back, very few charging stations in New Haven. Guildford Train Station does not have one. Milford has one, or has two, but one is usually broken and they’re not real good about maintaining them. There’s really only a couple in Guildford, so when I’m home and it’s in the garage it’s great, but it takes a little more planning I think, depending on where you are and what you’re doing. The Ford doesn’t have that super charge, but again, the technology is changing so fast that I probably, my next car, which hopefully won’t be for another five or six years, will probably be all electric and I’m hoping that infrastructure is better. But, as a point of entry into a technology, I love the C-Max. As Paul said, without the combustion engine, the maintenance costs are much lower. There’s just, you don’t have to have all those oil changes and all those other routine things. So, and it’s a really nice plus, it’s a quiet car when it’s on battery. It’s a quiet ride. I have a question about charging at home. Home charging.
That’s available I know for Tesla.
I’m not sure for others, but you do have to get a special device to charge it from your home, no?
On my Ford I didn’t have a 220 outlet, so I just go into a regular 120.
I’ve just put in a 220, so I can buy a new adapter and do that if I want.
But, it takes six hours on a 120 to charge for that 20 miles.

When you do that do your lights dim in your house?

Nope.

Good.

Thanks.

Paul, did you wanna say something?

I was just gonna comment on a couple things Denise said.
First of all, since I’m purely electric, I would find it impractical to do the 115.
It would just take a day or two to charge it up.

So, we put in 220, but I think as Daniel just noted it’s not a big deal.
You just run a 220, you probably have it on your dryer.

You just put, I just put a plug in the garage and charged it.

But, to Denise’s first point, what her typical driving is, when I was buying my car

I was going, well, what if do this
and what if I go to Washington
and what if I do this?
And he says look, why don’t you tell me
what you do in a typical week or month.
And when I did that it was quite instructive
’cause the reality is well, I go to work every
day,
so I didn’t need to, I don’t need to charge at
work.
I charge at home.
I go to the airport, used to go to the airport
tree, four times a month, but I could go there
and back.
And it’s instructive.
I think anyone on the call should just write
down
what you do with a vehicle in the course of a
month.
My guess is, it’s like Denise, it’s much more
local
than one worries about when you’re saying,
what’s the boundary condition of the car.
Your typical use is usually much lower.
I never used actually the charge at the local
grocer
or the garden center and stuff, ’cause I just
go out and do the things I do, go to work,
come back, I don’t go to work anymore,
but used to go to the office and come back,
just charge it at home.
And the only time I really would charge
in the train station mainly ’cause it was free
and it was kinda cool. I’d go to New York for the day and come back with a charged car. But, most of the things you can do in very limited radius as Denise indicated.

- Yeah, just to build on that. As I said, we’ve owned the car since the beginning of 2020 and of course, it’s been special circumstances, but we’ve never used an outside charger. We’ve only charged at home. And the range is about 240 miles on the Chevy Bolt. And so, actually we never have taken a trip, that round trip has been more than 240 miles, except for one time.

We traveled to Burlington, Vermont and in that case we decided the easiest thing, simplest, which is about 275 miles one way and we decided the easiest thing to do would be to rent the car, conventional car. So, that’s what we did.

I think a disadvantage of the Bold compared to Tesla is that, Paul, correct me if I’m wrong, but I believe those super charger charging stations are Tesla specific. Do you know if that’s the case?

- Yeah, that’s correct. They are, I don’t know, they operate
at something like 450 volts or something.

Yeah, they’re Tesla specific.

- Yeah, the Bolt doesn’t charge,

have a charging station that charges that fast.

So, that’s what made it more kind of inconvenient

to take a trip to Burlington because I believe

t he fastest, it’s called a level three

charging station, for the Bolt only does

about 20 miles, only puts on about 20 miles

an hour.

So obviously, to fully charge it you’d have

do it overnight.

So anyway, that is a disadvantage.

But we actually decided up front

that, and we did that calculation,

like how often do we really travel very far.

And the answer was we don’t.

And we decided we’d just rent a car

when we needed to and we still save

a lot of money I think.

- I should add, when I got my car

the super chargers were free.

So, if I’m going to New York I stop in Milford,

plug it in, get a cup of coffee

or if I go to the train station it’s free.

They now charge and to be honest,

I don’t know what the charge is.

So, if you buy a Tesla tomorrow morning

there’s a charge for using the super charger.

It almost had to happen.
I couldn’t see how it was sustainable to have free charging to some people. They’ll go just charge their car only at the super charger if they’re near one. They may give you a year of free charging, Paul.

Okay.

I wanna make one other comment and then see if Stan wants to talk specifically about your experiences. It was about up front cost. We haven’t dealt with that yet. So I could just, I could talk about the Bolt, which I can say runs great. I love it’s really quiet, as Denise was talking about. I love the quiet ride and it has really good pick up. I’d say it performs better than any gasoline powered car I’ve ever owned. But so, the cost, a new Bolt costs, well it depends on the features, but the average Bolt is roughly $38,000 to $40,000, and we got a deal kind of, we bought new 2019 in early 2020, so they gave us a good deal. And so, for the lease, for the three year lease the total amount that we’re paying over the three years is about $11,000. That’s pretty good for three years.
And so, I think some are more affordable than others,
but EVs are becoming more and more affordable.
So Stan, do you wanna talk a little bit about your experience?
My experience mimics Paul’s almost exactly. In fact, Paul was an inspiration for our thinking.
about the electric vehicle ‘cause we had owned
exclusively owned, hybrid vehicles since 2002,
all of our cars were hybrids.
Out two sons, my wife and myself.
And we really thought that wasn’t enough
given the circumstance of global warming
and we looked at the plug-in hybrids
and Denise did a great job reviewing
You can do all of your local travel.
Maybe you’re commuting, all electric.
And then, if you have to go to Burlington, Vermont
you’re in a hybrid.
So, it’s kinda the best of both worlds.
Currently just out of philosophy
because we went solar in our house
and so we thought if we went solar in our cars.
So, that was the biggest gift for him we could make
and since at this stage in my life
finances are not the biggest challenge.
I have the resources to go somewhere in my house and to buy an electric car, I thought it would be a good thing to do. And the experience with the car is absolutely remarkable. It’s almost like a sports car. It’s so lively and so responsive. It has so little maintenance attached to it. It really seemed like we were making a leap into a whole new advanced technology that is unambiguously the wave of the future and we were just dazzled at how mature that technology was already. The first time that we took it on a trip I had forgotten to plug it in and it was winter and my wife had a 6 a.m. flight to Puerto Rico and we stayed at the airport just for her convenience. And then I was driving to work to have my meeting with Heidi and I ran out of energy. It was somewhere around Wallingford, my car told me I was done. And I found on the web the nearest charging station, which happened to be a Choate School, for those of you who know where Choate is. So, I plugged in there for an hour and got enough to limp my way to the university and it was not a super charger,
it was just a conventional charging.
I had to figure out how to sign up and sync my credit card and just some pretty basic stuff.
And I had my meeting with Heidi as I was pacing the Choate parking lot ’cause I called her instead.
So, there was a humorous element to it.
And then on my way home I barely had enough, so I stopped at a local Greek diner that has a Tesla plug-in.
So it was that one untoward experience the very first week that we owned the car where I didn’t know what I was doing.
Beyond that, it’s been a year of smooth sailing and really no problems at all, easy to find charger.
It’s easy to charge them up, super charger, as Paul said, 20 minutes.
Conventional chargers, you can plug it in for an hour.
Thanks, Stan.
Daniel, did you wanna say anything?
You’ve posted a few comments.
Yeah, so I mean, I’ve had a Bolt for about three years.
I put in some of the, here I was just writing another comment, road trips you do have to do some work ahead of time,
but it’s usually something you can figure out.
Here, I'll just type in that comment I was gonna send.

Other thing, let me just type it up 'cause it'll be easier to write than to say, but I think people should think about their energy plans that they're using.

So, let me put in the chat about that.

Okay thanks.

One thing I wanted to say is it's really great never having to go to a gas station. I can't imagine ever attending a gas station again in my life or ever owning a gasoline powered vehicle.

I mean, the EVs are just so much more fun to drive and more convenient in so many ways except you know, for the ranges if you have to go on a longer trip, at least for me in the Bolt.

So, are there any questions, comments, concerns?

Feel free to raise anything, any kind of issues that you'd like.

Denise had her hand up.

Okay.

I did.

One advantage of my kinda hybrid was of course, I could go on a trip.

And last year I actually drove to the south, to Alabama, and I think if you're going to travel to that part of the country you probably
are gonna have a lot more problems than you did in the northeast. 
I did not see one charging station south of Pennsylvania.
- I have a friend with a new electric car and he went from Tennessee to California and he managed it well, but only because he planned very carefully, for exactly the reason that Denise outlined. And he told me he barely made his planned charging station in Arkansas.
You know, just made it with a few miles to spare, so to speak.
And he just mapped it out and he just decided this is where I recharge and have dinner. This is where I recharge, et cetera.
So, Denise is right that we are well endowed in the northeast and people should feel very comfortable getting an electric car in terms of the logistics of being able to charge if they make a longer trip.
But, most of us charge at home 'cause we're not going more than 200 miles in a given day. The problem with that is that it's a technology that's very suitable for suburban homeowners and very difficult for apartment dwellers. That's true.
That's one reason my son has not gotten an electric car 'cause he's in a townhouse.
and he's not controlling his parking garage and he has yet to negotiate that with the homeowners association, so you're absolutely right. I have a question. Yeah, go ahead. I actually wanna, I actually had looked into gettin’ a Tesla. I actually went and test drove it and I was kinda really impressed with how nice it drove. But, I'm actually have a 70 mile commute and I kind of was sort of put away from an electric car after we had that big power outage. And like I would not even have been able to get to work. How would I have been able to go? So, that was kind of, I'm kind of worried about that, with the power outages we have. I mean, I was out of power for six days. So, how can you guys, were you guys able to charge at, I guess, I don’t know how long you guys lost power. That’s actually, thanks for raising that point. That’s really quite important that when we have these power outages you’re always reminded how much you’re dependent on power. When I used to live in Bradford and we had
the big storm and we had power out for about a week or so I couldn’t use the car. You’re right, until the power was on. I have a generator where we are now ’cause we lose power couple times a year. But that is a down side. If your power goes out and you don’t have alternative power you can’t drive after a while, with the exception, I guess, what I did one time was I went in, I parked going into work, I went into work, parked at the train station, plugged it in to park. I guess there, Denise can say, I’m not aware of all the Yale charging stations now. That’s what I did. I went into the train station and plugged it in and it charged and did that for the remaining time after, while the power was out. And now I have a generator. That’s a real consideration. - Yeah, Martina, I would think that a plug-in hybrid might be a really really great option for you because they do have plug-in hybrids now that have a much longer range. And I don’t know it off the top of my head, but if you could find a plug-in hybrid that had 160 mile battery range and you would always have the gas engine as a backup.
One thing, this is gonna sound a little silly, but one thing I actually did for a while was Milford has super charging stations. Milford’s not next door, but it’s only an extra 10 or 15 minutes really, so I’d drive towards going to Milford, get something for breakfast or a cup of coffee. The car would be totally charged up. Go to work, go home and so, that’s another way. At least with Tesla there are enough super charger stations around. Another trip I make regularly is going up to Boston. There’s two or three places, well three or four places that I routinely use going up there to do round trips to Boston. You have to plan it, as others have said, but it’s very very manageable if you just give it a little thought. So, those charging stations are usually working even during power outages? I was wondering about that because I go by the Milford Mall every day on the way in and on the way out. It’s a good question. I’ve never run into them not working, but I’m sure there’s I don’t know. They must go out.
They do have big solar panels and battery arrangements, so I don’t know if they’ll operate when power goes out or not. The reason it was not a consideration for me is I have favorable public transportation near my home. I have a bus and I have a train that’s not so very far. So, I have backup. So I could take a chance on a one week power outage with an electric vehicle because of that. And actually, this is all false pretenses. The electric car is actually my wife’s and I still have a 2005 Prius. But, I use her car when she’s not gonna be using it on a given day. She’s retired and doesn’t travel, doesn’t drive each and every day. So I try to use the electric car as much as possible. But, if we let’s say the Prius was in the shop or we get rid of the Prius. (garbled audio) Lauren asked if there were tax incentives. My guess is Rob or someone else knows this better than I do. When I bought my Tesla there were pretty substantial tax incentives, but I was under the impression they expired.
a few years ago, but maybe someone else knows.

At the time there were both federal and state incentives and my impression was both of those expired.

not long after I bought my car.

Rob, do you know how those work?

You know, I believe they’re vehicle specific. So, once a certain number of cars have been sold of a particular type they expire.

So for example, I couldn’t get any kind of tax incentive for the Bolt because they had sold enough of them.

But, I don’t know the specifics really.

I’ve lost track about what the amount is, et cetera.

Does anyone know the answer to that?

- I don’t know currently, but when I bought mine in 2016 I got $9000 in incentives.

So, it’s worth looking at.

There’s actually a web page where you can look it up.

The Department of Energy and Environmental Protection.

It’s called Cheaper and I think it gives you exactly, you can look up the models and everything.

and tells you if there’s any incentive or not, if you get any rebates.

Several people have written comments about difficulty of charging at Yale.
and should Yale be encouraging it.
I wonder if that’s something the committee,
I don’t know if that’s too heavy a lift,
or is that something the committee could raise?
My guess is it’s not on a lotta people’s radar screen.
But, I think Tesla, if enough people petition,
you know, they will respond and put charging stations in certain places.
I don’t know what their policy now is,
but I wonder if Yale would do something about expanding the number of charging stations,
not just for Tesla, but for wide.
- I mean, that would be easy enough for us to raise that with the Yale Office of Sustainability
and see if it’s something they’re already thinking about or not.
I think that certainly makes a lot of sense to do that.
All right, any other questions or comments?
Okay, so if not I think we could wrap up.
Let’s see, here’s something.
Martina just posted the website.
All right, well thanks everyone
and I hope you found this to be a useful discussion and I’d encourage you all to go out and buy an electric vehicle.
It’s really fun.
- It’s the new version of Car Talk.
And let’s get Yale to provide more charging stations.

I think that’s a very good project.

Yeah, I agree.

Thanks everyone.

Thanks everyone.

Good talking to you.

Sorry it’s not in person, but always good to talk.

Yeah.

Thank you.