

1 STATE OF VERMONT  
2 PUBLIC UTILITY COMMISSION

3 CASE NUMBER 18-2660-INV  
4

5 INVESTIGATION INTO PROMOTING THE OWNERSHIP  
6 AND USE OF ELECTRIC VEHICLES IN THE  
7 STATE OF VERMONT

8 March 15, 2019  
9 9:30 a.m.

10 -----  
11 112 State Street  
12 Montpelier, Vermont

13 Workshop held before the Vermont Public  
14 Utility Commission at the Susan M. Hudson Conference  
15 Room, People's United Bank Building, 112 State Street,  
16 Montpelier, Vermont on March 15, 2019, beginning at  
17 9:30 a.m.

18 P R E S E N T

19 Commissioners: Anthony Z. Roisman, Chairman  
20 Margaret Cheney  
21 Sarah Hofmann

22 Staff: John Cotter, Deputy General Counsel  
23 Thomas Knauer, Policy Director  
24 Micah Howe, Staff Attorney

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 4     Melissa Bailey, VPPSA  
 4     Steve Farman, VPPSA  
 5     Tom Lyle, BED  
 5     Nicole Lepre, REV  
 6     Megan O'Toole, ANR  
 6     Collin Smythe, ANR  
 7     Sandra Levine, CLF  
 7     Pete O'Connor, Plug In America  
 8     Erick Karlen, Greenlots  
 8     Kevin Miller, ChargePoint  
 9     David Roberts, Drive Electric VT/VEIC  
 9     David Westman, VEIC  
 10    Nathaniel Shoaff, Sierra Club  
 10    Graham Turk, GMP  
 11    Brian Otley, GMP  
 11    Robert Dostis, GMP  
 12    Bill Powell, Washington Electric Co-op  
 12    Matthew Rutherford, Stowe Electric  
 13    Daniel Dutcher, VTrans  
 13    Andrea Cohen, VELCO  
 14    Katie Orost, VEC  
 14    Molly Connors, ISO New England

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1                   COMMISSIONER CHENEY: Good morning,  
2 everybody. Today's workshop is the third in a series  
3 as part of the Vermont Public Utility Commission's  
4 Case 18-2660-INV. We opened this investigation in  
5 response to Act 158 of the 2018 legislative session,  
6 which requires us to issue a report by July 1st this  
7 year on how best to promote the electrification of  
8 transportation in Vermont, to identify and eliminate  
9 barriers to the widespread switch to electric vehicles,  
10 recognizing that the transportation sector, the way we  
11 get around, is the largest contributor to greenhouse  
12 gases in the state.

13                   Today we'll be focusing on rate design and grid  
14 management. In response to the questions we sent out  
15 in advance of this workshop, we received detailed  
16 comments from nine participants: The Department of  
17 Public Service; from the utilities Green Mountain  
18 Power, BED, and in coordination with VPPSA and Vermont  
19 Electric Co-op. We also heard from the Alliance for  
20 Transportation Electrification, Greenlots, Plug In  
21 America, Tesla, and Sierra Club.

22                   First, I want to thank you for those very detailed  
23 comments -- they were helpful -- and thank you for  
24 coming today. I know some of you come from quite a  
25 distance. First, let's start by introducing ourselves.

1 I'll start over here.

2 MR. KNAUER: I'm Tom Knauer, Policy Director  
3 for the Commission.

4 COMMISSIONER CHENEY: And I'm Margaret  
5 Cheney, a Commissioner.

6 MR. COTTER: John Cotter, Deputy General  
7 Counsel for the Commission.

8 COMMISSIONER HOFMANN: Sarah Hofmann,  
9 Commissioner.

10 CHAIRMAN ROISMAN: Tony Roisman, Chair.

11 MR. ROBERTS: Dave Roberts, Drive Electric  
12 Vermont, VEIC.

13 MR. FARMAN: Steve Farman, VPPSA.

14 MS. LEPRE: Nicole Lepre, REV.

15 MS. O'TOOLE: Megan O'Toole, Agency of  
16 Natural Resources.

17 MR. SMYTHE: Collin Smythe, DEC - Air  
18 Quality.

19 MR. POWELL: Bill Powell, Washington  
20 Electric.

21 MR. RUTHERFORD: Matthew Rutherford with  
22 Stowe Electric.

23 MR. DUTCHER: Dan Dutcher, Vermont Agency of  
24 Transportation.

25 MS. BAILEY: Melissa Bailey, Vermont Public

1 Power Supply Authority.

2 MS. COHEN: Andrea Cohen, Vermont Electric  
3 Cooperative.

4 MR. DOSTIS: Robert Dostis, Green Mountain  
5 Power.

6 MR. WESTMAN: David Westman, Efficiency  
7 Vermont.

8 MR. SHOAFF: Nathaniel Shoaff, Sierra Club.

9 MR. CLARK: Jacob Clark, Department of Public  
10 Service.

11 MR. WHEELER: Scott Wheeler, Department of  
12 Public Service.

13 MR. ALLEN: Riley Allen with the Department  
14 of Public Service, and Dan Potter will be joining us a  
15 little bit later. He's at the legislature right now.

16 MR. KARLEN: Erick Karlen with Greenlots.

17 MR. O'CONNOR: Pete O'Connor, Plug In  
18 America.

19 MS. LEVINE: Sandra Levine, Conservation Law  
20 Foundation.

21 MR. OTLEY: Brian Otley, Green Mountain  
22 Power.

23 MR. TURK: Graham Turk, Green Mountain Power.

24 MR. LYLE: Tom Lyle, Burlington Electric.

25 MR. MILLER: Kevin Miller, ChargePoint.

1                   MR. HOWE: Micah Howe, Public Utility  
2 Commission.

3                   COMMISSIONER CHENEY: And do we have someone  
4 on the phone? All right. We were expecting someone  
5 from ISO New England. And do we know the status of  
6 that?

7                   MR. COTTER: No. Just waiting for the phone  
8 to ring.

9                   COMMISSIONER CHENEY: Okay, all right. Thank  
10 you. Our plan is to begin the morning with three 10-  
11 to 15-minute presentations followed by a morning break,  
12 after which we'll have a back-and-forth on specific  
13 issues. So we look forward to hearing your ideas and  
14 your experiences. Who of the four presenters has  
15 decided to start first?

16                  MR. OTLEY: I think we were up first, GMP.

17                  COMMISSIONER CHENEY: Green Mountain Power?  
18 All right.

19                  MR. OTLEY: I can plug in real quick. What's  
20 the easiest thing for you?

21                  MR. HOWE: I can either put it on my machine,  
22 or I can just give you the control if you've got that  
23 port. Oh, okay. You've got a converter, perfect.

24                  MR. OTLEY: Yeah. Thank you. Okay. So  
25 thank you for the time to talk about this very

1 important topic. I can't agree more. This is clearly  
2 one of Vermont's largest challenges from a carbon  
3 emissions standpoint, and so, from our perspective,  
4 most of the technologies and solutions to combat that  
5 are available in the market today. It's just a matter  
6 of getting them out there and getting customers to  
7 convert over to using them. So we are going to share  
8 just a little perspective on where we are, what we've  
9 done in the market, and what we've learned along the  
10 way, and I'm happy to take questions as we go.

11 So here we go. From an adoption standpoint, you  
12 know, the biggest focus we think right now is just  
13 getting vehicles on the road. Vermont's had some small  
14 successes in getting customers to adopt electric  
15 vehicles, but not, you know, not the sustained, you  
16 know, year-over-year growth that, you know, we think is  
17 possible. Survey results talk about generally price to  
18 acquire these vehicles is the biggest barrier, and,  
19 based on research that we've seen, 41 percent of  
20 respondents to surveys say that an incentive of the  
21 magnitude of 2.5 K, if available, would sway some of  
22 their buying decisions.

23 Coincidentally, you know, yesterday -- it's not in  
24 this material, but yesterday GMP announced a new  
25 electric vehicle incentive that we're rolling out.

1 It's up to, up to \$2,500 for GMP customers, including a  
2 low-income incentive, and we're trying to provide  
3 incentives for electric vehicles, plug-in hybrids, and  
4 what we think is an emerging used electric vehicle  
5 market, which we think is a very important thing to  
6 provide incentives towards as well.

7 So we're pretty much focused on, you know, helping  
8 customers acquire these vehicles. The value  
9 proposition of these vehicles from a fuel cost and from  
10 a maintenance cost standpoint has been well-known for a  
11 long time, and it's very compelling if you look at the  
12 total cost of ownership.

13 MR. TURK: I would just add to that,  
14 California, they collect a lot of details and data on  
15 their clean vehicle rebate program, and about 60  
16 percent of respondents say that the rebate was  
17 essential for their purchasing decision at almost all  
18 income segments. So it's a key driver to make that  
19 purchasing decision to get that rebate.

20 CHAIRMAN ROISMAN: What was the California  
21 rebate?

22 MR. TURK: They gave up to \$3,000. Now it's,  
23 it's taken down to, say, \$1,500, but it has an income  
24 sensitivity piece like ours that has an additional  
25 rebate money for low- and moderate-income customers.



1           CHAIRMAN ROISMAN:  And, obviously, the sale  
2 of an electric vehicle is another customer source for  
3 GMP.  Did you all run numbers to decide what is the  
4 upper limit of the rebate that you could afford and  
5 still have it make business sense?

6           MR. OTLEY:  Yeah, the upper limit of the  
7 rebate right now is, actually, it's the -- our, the RES  
8 Tier III provision, which allows us to provide  
9 incentives for fossil fuel switching, is actually the,  
10 the governor on that, and that, you know, we're, we're,  
11 where our rebate is now that we announced yesterday,  
12 we're very close to the upper limit of what Tier III  
13 allows.

14           COMMISSIONER CHENEY:  And you're referring to  
15 the alternative compliance payment?

16           MR. OTLEY:  Yes, yes.  So just lessons from  
17 the past, most of the utilities in this room enjoyed  
18 the Summer of Love in 2017 where, you know, Nissan  
19 North America teamed up with the DUs in Vermont to  
20 offer a \$10,000 incentive off of LEAF purchases.  You  
21 know, it was about a four-month period of time, but the  
22 number of vehicles that were acquired during that  
23 program were, was impressive.

24           Freedom Nissan in South Burlington became the  
25 number two LEAF dealer in the whole country, not on a

1 percentage basis, on an absolute number of vehicles out  
2 the door basis, which, when you look at the size of the  
3 Burlington market compared to some of the other markets  
4 in the country, is pretty impressive. So that was a  
5 huge success. It was a time-limited thing, and but it  
6 really hammers home the point that price matters and  
7 that customers will pay attention if you offer  
8 compelling price points for these vehicles.

9 So, today, Nissan continues in their, in their  
10 current-year volume or current-year model to offer a  
11 \$5,000 discount, \$5,000 discount, which we are, you  
12 know, seeing some uptake on, not the same level as the  
13 Summer of Love, but, you know, steady. I think GMP  
14 customers acquired 45 or so LEAFs last year under that  
15 program, and with the announcement of our new incentive  
16 coupled with this type of discount, we expect to see  
17 more of that.

18 The nice thing about our incentive is it's going  
19 to be vehicle, or it's going to be model and vehicle  
20 independent, so it can be applied to any EV or plug-in  
21 hybrid, not just dedicated to Nissan, but we certainly  
22 are fans of when manufacturers like Nissan have put out  
23 these incentives themselves that we can partner with  
24 and couple with to create a more compelling value  
25 proposition.

1           We've also done some stuff in the past with  
2 Alderman Chevrolet down in Rutland where they're  
3 offering employee-level, GM employee-level discounts to  
4 our customers, so that's helped a bit, and we saw some  
5 Bolts move and some Volts move in 2018 as a result of  
6 that.

7           We offer, as I talked about earlier, there is an  
8 additional low-income incentive available to low-income  
9 customers, and we're applying that both to new vehicles  
10 and preowned vehicles. The preowned electric vehicle  
11 market is becoming vibrant. Those vehicles are  
12 typically coming in off of leases. They're fairly low  
13 mileage. They've got a lot of life left into them, and  
14 they're at very good price points from a purchase  
15 standpoint.

16           MR. COTTER: Excuse me. It says funding  
17 source contributions in there. Could you just give us  
18 a little more information on what contributions refers  
19 to?

20           MR. OTLEY: Yeah. So the, the GMP is  
21 directing some of its charitable giving dollars to some  
22 of these incentives. These are below-the-line,  
23 below-the-line contributions. They're not included in  
24 our cost of service, so they're not paid for by  
25 customers, but they're, we think, based on the,

1 predicament we are in with climate change and with  
2 carbon, that we want to see all or as many of our  
3 charitable contributions going towards carbon solutions  
4 as we can, so that's part of that funding.

5 MR. COTTER: Okay, thank you.

6 MR. OTLEY: And then we've been very  
7 successful with providing a residential Level 2 smart  
8 home charger to electric-vehicle-adopting customers  
9 through our Tier III program, and that allows us to  
10 have visibility and control over charging sessions at  
11 home and aggregate that charging capacity in demand  
12 response events when we want to avoid peaks and things  
13 like that. So we've got about almost 300 of those  
14 units installed and active today that we can see and  
15 operate on a daily basis. We only call events a couple  
16 times a month, if that, but, when we do call them,  
17 they're valuable in helping us to reduce that capacity  
18 during peak events.

19 MR. TURK: And having those installed in  
20 customer homes is going to be really important for  
21 offering EV-specific charging rates so that you can,  
22 you can do it all through the charger and have  
23 visibility into behavior and management.

24 CHAIRMAN ROISMAN: And are you able yet with  
25 that charger to tap into the battery of the car?

1           MR. OTLEY: We're not able to pull power out  
2 of the car. We're only able to curtail a charging  
3 event.

4           CHAIRMAN ROISMAN: And is that a limitation  
5 in the charger or a limitation in the car?

6           MR. OTLEY: It's certainly a limitation in  
7 the charger today. The certain, certain electric  
8 vehicles do have the ability to dispatch battery out on  
9 a signal but not all of them. The only one I'm aware  
10 of is the LEAF has been able to dispatch out a couple  
11 of model years back, but there are no use cases for  
12 that in the US yet. They're piloting that in Europe  
13 right now.

14          MR. TURK: I saw, actually, there's one pilot  
15 project in Austin, Austin Energy doing it, where they  
16 have a single LEAF being used for bidirectional  
17 charging, but it's very nascent and really just a test  
18 case at the moment.

19          MR. COTTER: Is it accurate that there may be  
20 some warranty issues with the, the batteries from the  
21 EV manufacturers associated with the bidirectional  
22 flow?

23          MR. OTLEY: There could be if the -- so the,  
24 the LEAF has actually been designed for bidirectional  
25 flow. So, as long as -- there are some limits to what

1 you can do, but, as long as you stay within those  
2 limits, you're good. Other manufacturers I'm not as  
3 familiar with, but, if you're doing something against  
4 the manufacturer's intent, then you're probably going  
5 to run afoul of warranty issues.

6 MR. COTTER: Okay, thanks.

7 CHAIRMAN ROISMAN: And just one last thing on  
8 the charger. Is it that there isn't such a charger  
9 available or it's not the kind of charger that GMP is  
10 now making available?

11 MR. OTLEY: We are not aware of a  
12 commercially available charger that allows  
13 bidirectional residential charging at this time. We  
14 are aware of some piloting that Nissan's doing on,  
15 actually, on their own campuses, their manufacturing  
16 campuses right now, and we've been in touch with the  
17 suppliers of those chargers, but they are not  
18 commercially available yet.

19 CHAIRMAN ROISMAN: Thank you.

20 MR. OTLEY: This is just a depiction of our  
21 charging program pilot. You can see, you know, this  
22 is, represents aggregate load over a period of time,  
23 and you can see the shaded area. It's not as clearly  
24 depicted on the wall. I apologize. But you can see  
25 the area where basically charging sessions go flat.

1 That's a called event.

2 The way we work that is we send a notification,  
3 either via text or via email, to participating  
4 customers several hours ahead of time giving them the  
5 opportunity to opt out if they don't want to be  
6 curtailed during that event. If they do not do  
7 anything, then they're participating in the event, and  
8 then, during the hours that we've called, the  
9 curtailment occurs, and at the end of those hours, the  
10 charging sessions resume for those vehicles that are  
11 plugged in at that time.

12 So far, we've got, like, a 98 percent  
13 participation and acceptance rate on those events, and,  
14 because these are Level 2 chargers, we haven't had a  
15 single incidence of somebody participating in an event  
16 and not having the charge that they want the next  
17 morning or whenever the next time they use the vehicle.

18 COMMISSIONER HOFMANN: So, Mr. Otley, you  
19 indicated that it's several hours ahead. How far ahead  
20 will you tell people there's going to be an event  
21 between these hours?

22 MR. OTLEY: Yeah. Usually, 24 hours is the  
23 norm, but it can be, I think -- I participate in the  
24 program myself. The latest notification I think I've  
25 seen is about 12 hours ahead of time.

1           COMMISSIONER CHENEY: Do the customers who  
2 are doing this know why? In other words, do they have  
3 a sort of a contributory purpose in mind that they are  
4 helping to, the utility to shave peak, or are they just  
5 -- what is the education behind that is what I'm  
6 asking. What is their incentive?

7           MR. OTLEY: Yeah. As part of enrolling in  
8 the program, we talk to, we describe for them the types  
9 of events we call around, which are mostly around peak  
10 events, and then, in the wording of the alert itself,  
11 it talks about conditions are such that a peak event is  
12 likely today, and we will be, we're calling for a  
13 curtailment event, so that they have that context, and  
14 then it offers them the opportunity to opt out of that  
15 event if they choose to.

16           MR. TURK: And, among the 282 chargers, about  
17 half those are participating in the unlimited charging  
18 program, which is on the next slide, and so for those  
19 customers there's a financial disincentive to charge  
20 during the peak periods. Just a little explanation of  
21 the graph, the reason that the dark blue line spikes  
22 after that event is over is that you can think of all  
23 the chargers that are plugged in that are being delayed  
24 until that event ends, they all turn on at the same  
25 time, and so it's, there's some natural variation



1 during the event if we just let it run, and that's what  
2 the baseline is for. So all of those are now starting  
3 at the same time, so it's a much higher load than if  
4 they'd been plugged in.

5 COMMISSIONER CHENEY: But, presumably, Green  
6 Mountain Power would anticipate that and then make sure  
7 that they're getting back on in a safe period, not at  
8 the tail end of a peak where you might still have an  
9 issue?

10 MR. OTLEY: Oh, yeah, yeah. So we definitely  
11 make sure we clear the peak. But, you know, at scale,  
12 if we had a hundred times the number of participants in  
13 this program, that spike could cause us some issues,  
14 but the chargers allow you and the curtailments allow  
15 you to feather those in over a period of time rather  
16 than just ramping them up all at once. But at 282  
17 chargers it's not enough to have that be a worry.

18 MR. TURK: They're also spread  
19 geographically, so it's not all in the same theater.

20 MR. COTTER: So I take it from this, in other  
21 words, then that you have the ability to send a remote  
22 signal that shuts just the charger down and it doesn't  
23 influence the power flow to the house generally.

24 MR. OTLEY: Exactly, yeah.

25 MR. COTTER: Good.

1           MR. OTLEY: No, no. You're just curtailing  
2 that charger. It's Wi-Fi enabled, so you're  
3 communicating through that. It's just for that  
4 charging device.

5           MR. COTTER: Right, okay.

6           COMMISSIONER CHENEY: We have a question.

7           MR. POTTER: Dan Potter with the Public  
8 Service Department. Does the shaded line on the graph  
9 up here, does that represent what you expect charging  
10 would have been during the event without the called  
11 curtailment?

12           MR. TURK: That's the light blue line. So  
13 it's hard to see here, but it says "baseline". That's  
14 exactly right. So that's not -- it's taking what the  
15 presumed charging would have been if we hadn't called  
16 any events, projecting that out over -- and that's how  
17 we arrive at the number curtailed, and then the dollar  
18 savings is directly the cost, the RNS cost for that  
19 month and then how many kilowatts were reduced as a  
20 result of the curtailment.

21           MR. OTLEY: Okay. During our pilot, our, our  
22 charging pilot, we also have offered an unlimited plan,  
23 charging plan. So, basically, for 30 bucks a month,  
24 you get EV charging capped at \$30 a month. We've had  
25 about half of our participants enrolled in this. We

1 were experimenting with different price structures,  
2 basically, trying see if that had a major impact on  
3 behavior or perhaps was a draw for customers to adopt  
4 these vehicles as well.

5 It was an interesting, interesting part of the,  
6 part of the pilot. What we learned is customers are  
7 driving these vehicles more than we thought they were,  
8 so which is a good thing, right? So EV customers are  
9 not using these vehicles as just, you know, kind of to  
10 go to the, around the corner to the market. They're  
11 actually using them as full-time vehicles. The annual  
12 mileage that they're putting on is, is, you know,  
13 becoming more comparable to combustion vehicles, and  
14 so, because of the range improvements that the  
15 manufacturers have made, these are viable, you know,  
16 certainly secondary and primary vehicles for customers  
17 in most use cases that they have for transportation.

18 We will not be continuing the unlimited plan into  
19 a tariff, because we think there are other ways to  
20 provide different incentives and, you know, price  
21 signals and things like that, but it was an interesting  
22 part of lessons learned that we did, and we're glad we  
23 did it.

24 COMMISSIONER CHENEY: Mr. Allen has a  
25 question. I'm sorry.

1 MR. ALLEN: I'll defer to you.

2 COMMISSIONER HOFMANN: Go ahead, Riley.

3 MR. ALLEN: So it's my impression kind of  
4 historically that electric vehicles were actually  
5 driving shorter distances relative to internal  
6 combustion engine vehicles. So this is a little  
7 surprising. Do you attribute this, the fact that the  
8 vehicle miles traveled was greater than you expected a  
9 selection, self-selection bias by customers, that is,  
10 customers that expect to drive more are the ones that  
11 are more likely to participate in a buffet-style  
12 program? Did you understand the question?

13 MR. OTLEY: Yeah, I do, and I don't think I  
14 have a good answer for it, Riley. It's, I think we're  
15 -- I'd look at it more simply which is just the  
16 vehicles are, are, have equivalent, almost equivalent  
17 capabilities to gas vehicles, and people aren't using  
18 them any differently than gas vehicles. Therefore, the  
19 mileage is higher than we expected.

20 You know, if you turn the clock back ten years,  
21 these were kind of boutique, odd little vehicles with  
22 limited range, and so you had to use them under those  
23 conditions in limited-use cases. Now those use cases  
24 are expanded or they've gone away, and it's all --  
25 they're just vehicles now, you know? So I think that's

1     why we're seeing the higher mileages.

2                   COMMISSIONER HOFMANN:    So you had -- I think  
3     Austin Energy had the same program, a \$30.  Do you  
4     share information with other utilities that may have  
5     done the same thing?

6                   MR. TURK:  We didn't, we didn't talk to  
7     Austin, or at least I didn't particularly, but I know  
8     their program also incorporates public charging, and so  
9     it's, it includes stations that they own in the City of  
10    Austin.  So it's a little bit more expansive.  This is  
11    only for residential charging.  So, if you were to go  
12    to a public station, you wouldn't be covered under this  
13    program.  But we are in touch.  I'm on a call every  
14    month with innovation reps at each utility, and so  
15    there's some information sharing around EV thinking.

16                  MS. LEVINE:  Why are you moving away from the  
17    unlimited off-peak charging?

18                  MR. OTLEY:  The way we had it set up it was,  
19    it was, it was more of a, of a loser than it was --  
20    people were, were -- we were subsidizing, basically,  
21    too much.  You know, I think the average actual cost  
22    under the, under the flat price program when we looked  
23    at it in retrospect was like, it was probably closer to  
24    50 bucks a month of actual kWh that they were using,  
25    some higher, some lower, but, on average, it was well

1 above that threshold, and it didn't seem to us that  
2 that flat rate was that much of a driver of people's  
3 behaviors or their decision making on to get into these  
4 vehicles, so --

5 MS. LEVINE: Did you do any outreach or  
6 questioning about, you know, if we increased it to \$50,  
7 would you continue to do flat rate? I just --

8 MR. OTLEY: Yeah, we, we did a little of  
9 that, and, and the people just stopped tracking it, so  
10 it was a hard question to get good feedback on. Yeah,  
11 okay. I'm going way over my time. I apologize.

12 COMMISSIONER CHENEY: I realize that, and  
13 it's partly because we're getting a lot of questions.  
14 I think the questions are good. So, so, yeah, you're  
15 at 20 minutes now, but I think it's positive. Go  
16 ahead.

17 MR. OTLEY: Okay. These are just two things  
18 to show. As the Chairman pointed out earlier, this is  
19 new load for us, right? Any time we can convert  
20 gasoline miles to electric miles, that's new load.  
21 We've done some sensitivity analysis of the low,  
22 medium, and high projection of what that looks like  
23 over a ten-year period, and, based on everything we  
24 see, even a high projection is not going to cause us,  
25 you know, much concern about having to do significant

1 upgrades to the distribution system to handle this kind  
2 of load, which is a good thing.

3 We've got the overhead. We've got the room to  
4 manage this, this load, and, frankly, this load simply  
5 slows down some of the load decrease we're seeing year  
6 over year due to the effects of efficiency and net  
7 metering, so it's a good thing.

8 MR. TURK: And, just quickly, on the demand  
9 chart it's an asterisk at the bottom, but that peak  
10 coincidence is assuming no management, and so think of  
11 it as worst case, but it highlights the importance of  
12 distributing those smart Level 2 chargers so that we do  
13 have the ability to curtail during peak events.

14 MR. COTTER: Does the idea that you're  
15 basically capable to absorb this load going forward,  
16 does that make any assumptions about how the load is  
17 distributed out of your service territory? In other  
18 words, is it, are you assuming it's smooth? Are you  
19 saying, well, you know, We could get a cluster of EV  
20 purchases over in this particular neighborhood, and, if  
21 so, does that cause potential problems on a specific  
22 distribution circuit?

23 COMMISSIONER CHENEY: And may I add to that  
24 question? Do you track where EV adoption is taking  
25 place?

1           MR. OTLEY: We know where the customers are  
2 located that are participating in our programs. If  
3 someone procures an EV on their own and doesn't let us  
4 know and is just wall-charging it, we would not  
5 necessarily know about that, but it, because of -- so  
6 we do have some assumptions that it will be fairly, it  
7 will be representative of where the population sits in  
8 our service territory.

9           So it will be more dense in some of the more  
10 populated areas and less dense in some of the less.  
11 But, again, as Graham pointed out, because of the  
12 ability to control those charging sessions -- and  
13 that's, that is fundamental to our strategy going  
14 forward -- we, you know, we're very confident that that  
15 increased charging activity will not cause us problems.

16           CHAIRMAN ROISMAN: As you know, even the high  
17 here is well below the mark that has been set as the  
18 goal for 2025, which is 50,000 vehicles. If that mark  
19 were hit, if we had -- if we were on track, which we're  
20 not now --

21           MR. OTLEY: Right.

22           CHAIRMAN ROISMAN: -- would that create a  
23 problem in terms of your load distribution?

24           MR. OTLEY: No. Our sensitivity analysis  
25 looked at that, you know, staying on track with the



1 most aggressive build-out, and we are very confident  
2 we're fine, yeah. We welcome that load.

3 Okay. In terms of what we're doing in terms of  
4 workplace and public charging programs, we're trying a  
5 few things. We've got a partnership with Tesla to  
6 install workplace chargers. They've got some dollars  
7 available to help facilitate those types of  
8 installation where they're paying for hardware, and  
9 they help subsidize the installation.

10 We're also helping businesses, some of our  
11 business customers. We're trying to encourage them to  
12 offer their employees workplace incentives as part of  
13 their benefits package for adopting EVs. A few  
14 businesses in the state offer that as a part of  
15 employee benefits where, if an employee adopts an EV,  
16 they'll give them, you know, a few hundred dollars  
17 towards that to help encourage that. We've offered a  
18 matching program to that. If someone will start an EV  
19 incentive for their employees, we'll match up to the  
20 first \$600 to try to create another \$1,200 incentive  
21 for them. Just trying get more vehicles on the road.

22 And then we're also offering a \$375 per port  
23 incentive for public charging stations that get put in  
24 into businesses, retail locations, wherever the public  
25 may want to access those things.

1                   COMMISSIONER HOFMANN: Mr. Otley, does the  
2 employee have to be a GMP customer or only the business  
3 be a GMP customer?

4                   MR. OTLEY: Um, boy, good question.

5                   COMMISSIONER HOFMANN: That's okay. Just  
6 wondering.

7                   MR. OTLEY: I don't know. Yeah, moving on --

8                   COMMISSIONER HOFMANN: Yeah.

9                   COMMISSIONER CHENEY: Moving on, because  
10 you're running out of time.

11                  MR. OTLEY: Yeah. Thank you. Thank you.

12                  MR. LYLE: If I could, that would be a good  
13 opportunity for the utilities to work with each other  
14 to say, you know, if an employee lives, works in GMP  
15 territory but lives in another territory, there's no  
16 reason why we couldn't share.

17                  COMMISSIONER CHENEY: Excellent point.

18                  MR. OTLEY: This is a whole lot of words  
19 about demand charges. Our view on, on demand charges  
20 is, certainly, for public charging is, you know, demand  
21 charges are an important part of understanding the cost  
22 of providing this type of service. We do not want  
23 demand charges to get in the way of a further build-out  
24 of these types of stations.

25                  You know, we're of the mindset that we're hoping

1 that some vibrant third parties continue to expand the  
2 charging network in Vermont and create some innovation  
3 through how they decide to price things and how they  
4 market those services, and we want to be fully  
5 supportive of that, and so, you know, we want to make  
6 sure the demand charges get paid attention to but don't  
7 become an obstacle to a build-out of a vibrant public  
8 charging network.

9 So, in terms of deployment, we've deployed over a  
10 hundred Level 2 and DC fast chargers across the state  
11 thus far. We're seeing a higher utilization rate of  
12 those stations year over year, though there is still  
13 plenty of capacity for those to be accessed by the, the  
14 EV-owning public. So I don't think public charging is  
15 the biggest obstacle to growing this stuff, but it is  
16 certainly an element in the, you know, creating a  
17 vibrant offering that gets people to convert over to  
18 vehicle electric.

19 CHAIRMAN ROISMAN: Are you seeing any major  
20 difference between where you have the fast charger,  
21 where you have the Level 2 charger in terms of  
22 customers who are taking advantage of those chargers?

23 MR. OTLEY: Yeah. I mean, the fast chargers  
24 are generally in kind of -- what would I call it -- you  
25 know, through-passing locations where, you know,

1 they're strategically placed just off the interstate so  
2 that people who are making longer distance trips can  
3 access them. They're usually located adjacent to some  
4 sort of service or entertainment that can give, you  
5 know, occupy them for 30 minutes while they're  
6 charging.

7 So that's typical use case for those chargers, and  
8 then the Level 2s are being used, you know, more  
9 locally by folks who just either need to top off  
10 quickly or they want to access something while they're  
11 doing an hour's worth of grocery shopping or seeing a  
12 movie or whatever that might be. Does that answer your  
13 question?

14 CHAIRMAN ROISMAN: Yes.

15 MR. OTLEY: In terms of charger precision and  
16 the billing process, we've had good success with our  
17 home chargers. You know, there's a .76 percent  
18 difference compared to a utility meter that we have  
19 measured so far, which we deem sufficient for our  
20 pilot. There's, there's more variation on the DC fast  
21 chargers depending upon how you measure them. DC fast  
22 chargers have a lot of stuff going on in there as they  
23 convert AC to DC, and it's pretty high-speed stuff, so  
24 there's a little bit more loss involved, but the  
25 accuracy on those has not been the same.

1           MR. TURK: Yeah. On the 0.76 number, that is  
2 for wall-mounted home chargers, not public Level 2  
3 stations. And so we, we deem that sufficient to run  
4 our pilot where we were subtracting out all of the  
5 kilowatt-hours consumed by the charger from the home  
6 bill and then adding back any kilowatt-hours consumed  
7 during the on-peak period charged at the 60 cents per  
8 kilowatt-hour.

9           So it's a manual billing process where, you know,  
10 we're downloading the full charging data and  
11 subtracting and adding back in. So we recognize that,  
12 as we roll this out on a larger scale, we'll need to do  
13 some automation to streamline that process.

14           MR. OTLEY: So that's about it. I'll just  
15 wrap up by saying, you know, we are all in with  
16 electric, vehicle electrification. We think it's, you  
17 know, a huge part of the carbon challenge we have as a  
18 state, and, you know, we're trying to do as much as we  
19 can and push as hard as we can to promote the  
20 technologies. Because they're here today. It's just a  
21 matter of getting Vermonters to adopt them.

22           COMMISSIONER CHENEY: Thank you. And many of  
23 the topics you raised we will also be going into more  
24 depth with the back-and-forth this afternoon. So thank  
25 you. And who is Number 2 with presentations? Is it

1 Plug In America?

2 MR. O'CONNOR: So I'm Pete O'Connor with Plug  
3 In America, and who we are, so we're a national  
4 organization of electric vehicle drivers founded in  
5 2008. This is, you've heard this all before. Go on.  
6 And our priorities when it comes to EV charging  
7 infrastructure are more EVs on the road and, therefore,  
8 more, more chargers. We'd like them to be low-cost,  
9 high-reliability and high-visibility. Driver friendly,  
10 we've had some processes with NESCOM in ensuring that  
11 they're driver friendly. Managed charging, we think,  
12 is best done through time-of-use. We are not opposed  
13 to smart charging and the more intricate grid  
14 interactions, but we want to see cost benefits. So  
15 next item.

16 So, if the value is there after accounting for all  
17 the soft costs and everything and the drivings are  
18 prioritized, then we can get behind it. We've heard  
19 some states asking for this capability in any stations  
20 that are supported through the Volkswagen funding or  
21 through utilities, and that's without doing a  
22 cost-benefit analysis of the transaction costs, the  
23 implementation, the staff time required, the impact on  
24 the driver, the, you know, marginal loss of utility.

25 There is value there, but it's also cost. This

1     capability does not come for free.  Whether it's the  
2     subtractive the billing you had to do or the  
3     implementation, the systems integration, the bandwidth  
4     occupied by the communications systems, there's a lot  
5     of small costs that add up to get this more involved  
6     smart charging to work.  Next slide.

7             So, before I was at Plug In America, I was at  
8     Union of Concerned Scientists, and I actually did a  
9     report on this -- I have a link there to it, I think,  
10    in next item -- looking at the business case for smart  
11    charging and to the extent to which it would help the  
12    grid handle more renewables.  Generally, I found there  
13    is a value.  It's not very large.  A lot of the pilots  
14    had found that the value did not outweigh the  
15    implementation cost.  This was the LA Air Force Base  
16    Vehicle to Grid, the Frito Lay delivery trucks in  
17    Texas.  The BMW PG&E pilot in the Bay Area relied  
18    mostly on stationary batteries and not on the vehicles.  
19    So, at this point in time, there have been fairly  
20    unsuccessful pilots due to these soft costs, more so  
21    than the technology costs.  Next slide.

22            So VGI can both reduce the EVs' own impact on the  
23    grid, the impact they place on the distribution, and,  
24    next, they can possibly help with other grid conditions  
25    such as -- well, first we have this.  What is VGI?  It

1 can be the basic smart charging as using time-of-use  
2 rates to align your demand with your supply. Then  
3 there's the short-term ancillary services. These might  
4 be through the ISO or, just for the utility, like  
5 demand response, frequency regulation.

6 Vehicle-to-grid is a two-way energy flow which  
7 does energy storage. The concerns there are you have  
8 interconnection. You're putting power onto the  
9 utility, which requires an additional level of  
10 engineering to ensure safety, and you have a  
11 possibility of battery degradation.

12 One reason the car manufacturers are concerned  
13 about this is that their battery warranties are based  
14 on the number of cycles of charging, and, normally,  
15 they expect that to be through driving, but, if you put  
16 on twice as many battery cycles through charging onto  
17 the grid, you're going to age the battery twice as fast  
18 all else being equal. Not even accounting for any  
19 differences in how that power flow impacts the battery,  
20 you're just using it more, you know, even if you solve  
21 everything else. So their warranty that is based on  
22 miles driven is no longer valid.

23 And then I think the best case for vehicle-to-grid  
24 is actually vehicle-to-home or vehicle-to-building for  
25 backup power when you're islanded and not on a grid



1 connection, because backup power is very valuable. And  
2 Nissan is doing this -- they started it in Japan after  
3 Fukushima -- where it can run your refrigerator,  
4 lights, computers, not your AC, but it can run a lot of  
5 small systems for several days with a 40-kilowatt-hour  
6 battery. So these are, you know, a few different types  
7 of vehicle-to-grid integration.

8 The duck curve, we haven't seen this ISO New  
9 England. This is a California example, of course, but  
10 we're starting to see it in ISO New England as well,  
11 and the ideal application for vehicles to help with  
12 that is workplace charging, especially in the 10:00,  
13 11:00, 12:00 o'clock hours when AC demand in the summer  
14 hasn't really ramped up but vehicles are there, the sun  
15 is shining, and they can replenish their commute from  
16 the way into work, workplace charging at Level 2, and,  
17 yeah, that's a pretty good application. Move on.

18 So the obstacle, what is the value proposition for  
19 each of these different approaches? Time-of-use is  
20 easy, but it misses the daily variations. You can't  
21 respond to a specific, a specifically hot day if you  
22 have time-of-use pricing. It doesn't give you that  
23 dynamic ability, and you have that spike, as we saw on  
24 the Green Mountain Power, which you can solve pretty  
25 easily through staggering the return of the chargers to

1 the system instead of all coming on at midnight,  
2 whatever.

3 San Diego Gas & Electric was trying day-ahead  
4 dynamic pricing. They would send you hourly prices for  
5 power the next day. You could have an app to just  
6 optimize your charging for that. It sounds  
7 complicated, but apps can, you know, do stuff like that  
8 pretty easily. It's still, it's somewhat time-of-use  
9 but just more fine-grained.

10 Then the realtime communication with the grid  
11 through demand response or frequency regulation, those  
12 are technically proven. There was a high value for  
13 this in PJM which got a lot of excitement, but you  
14 can't extrapolate from that for a couple of reasons.

15 The cost of the additional communication layer is  
16 uncertain, and that's, as I said, the soft costs, the  
17 hardware costs, the network costs, and then the  
18 implementation costs all together have to be  
19 considered, and, when you add lots of resources doing  
20 this, the market saturates, and the value that you get  
21 falls. So, if you had hundreds of thousands of EVs,  
22 every one would get a very small value from doing  
23 things for the grid.

24 Time-of-use gives you sort of preemptive demand  
25 response, anyway, moves the load out of those peak

1 periods before a peak event happens so that vehicle's  
2 not there charging able to respond.

3 More EVs make it easier to predict availability.  
4 You don't have to worry about only having, you know, a  
5 hundred in your pilot. If you have 10,000, you have a  
6 far greater accuracy in guessing how many will be  
7 charging at any one time just through large numbers.  
8 Then you have less value per EV as the market fee  
9 services saturates. So the most important issue is the  
10 use case. What are you trying to accomplish with smart  
11 charging? What problem are you trying to solve? And  
12 then you decide what solution is best. Call this up.

13 All right. If renewable energy integration is  
14 easy, and it has been to date, there's not a large  
15 value in the grid services market. The wind and solar,  
16 their impacts on the grid show up in ISO New England's  
17 prices for services like frequency regulation. If it's  
18 easy, we don't even need that. If it's hard, it would  
19 be a high value for both smart charging and dedicated  
20 energy storage. The value shows up in these market  
21 prices, and options will compete in a race to the  
22 bottom, so know what service you're trying to provide.

23 And I'd love to hear more about Green Mountain  
24 Power's soft costs and implementation and how they see  
25 that in the future as they scale up their program and

1 making it easier to operate. Thank you.

2 COMMISSIONER CHENEY: Thank you. You've  
3 brought us back on schedule.

4 MR. O'CONNOR: Was that too fast? I'm sorry.

5 COMMISSIONER CHENEY: No, it was perfect, and  
6 you have packed a lot in there, so thank you very much.

7 CHAIRMAN ROISMAN: I had one question. When  
8 you're doing your cost-benefit balance, what do you do  
9 with the external costs? If we, if we solve the carbon  
10 problem, we have a huge economic benefit, but that's  
11 not factored into that cost-benefit that you're doing  
12 there.

13 MR. O'CONNOR: It can be. I mean, the  
14 analysis I did at UCS -- and I can send you the report  
15 -- we did actually monetize the emission reductions  
16 from doing this. One important caveat is that off-peak  
17 charging is not necessarily the cleanest charging. In  
18 some parts of the country, shifting your load to  
19 off-peak means sustaining coal plants who would  
20 otherwise go out of business. That's not the case here  
21 in Vermont, obviously.

22 So we did not do a Vermont-specific analysis, and,  
23 if we did, it would show no carbon, right, in that  
24 electricity. Even for ISO New England, it would be  
25 quite low. But you can include those costs in terms of

1 the, how it changes the load of what's generated in not  
2 only carbon but also particulate matter, SO2, NOx, and  
3 you can monetize those emissions as well.

4 COMMISSIONER CHENEY: So, in referring to  
5 your report, are you talking about the smart-charging  
6 report that you had linked to on your, one of your  
7 slides?

8 MR. O'CONNOR: Yeah. We did an analysis of  
9 the grid with managed charging and unmanaged charging.  
10 It was national scale. Its applicability to Vermont is  
11 a bit different, but I'm sure you could find an  
12 analysis for Vermont showing the load profiles under  
13 both managed and unmanaged.

14 COMMISSIONER CHENEY: Thank you.

15 MR. COTTER: I wanted to make sure I  
16 understood your terminology. When you say time-of-use  
17 rates, are you sort of including a range of options  
18 starting at one end, say, being a fairly blunt  
19 off-peak, on-peak and at the other end the sort of  
20 day-ahead hourly that you were talking about?

21 MR. O'CONNOR: Yeah. Mostly, we're talking  
22 about the blunt ones which still need to be adjusted  
23 periodically, maybe seasonally. And the San Diego one  
24 is kind of blurring the line between realtime pricing  
25 and time-of-use. It's almost realtime, because it's a

1 day ahead.

2 MR. COTTER: Right, yeah. I've heard  
3 sometimes people use time-of-use to be more of the more  
4 precise, and then they just refer to the  
5 off-peak/on-peak as off-peak/on-peak. So that's, the  
6 terminology gets a little blurred for me at times.

7 MR. O'CONNOR: Yeah. Time-of-use, I think,  
8 generally refers to the blender of off-peak/on-peak,  
9 maybe the three, maybe a shoulder period too. That's  
10 how I've heard it.

11 MR. COTTER: Okay, thanks.

12 COMMISSIONER CHENEY: Have we decided who's  
13 next?

14 MR. HOWE: Greenlots? There we go.

15 MR. KARLEN: Hello, everyone. I'm Erick  
16 Karlen. I'm with Greenlots. Good to be here this  
17 morning. I'm going to be very brief, a handful of  
18 slides here, high-level. Save most of our comments for  
19 when we get to the respective issues in the afternoon  
20 if you'll leave time for that process. Admittedly,  
21 when we put this together and requested this time, we  
22 didn't really know the format of today, so just going  
23 to touch on some high-level stuff, and we'll get to  
24 this in the afternoon.

25 So, Greenlots, we're a provider of electric

1 vehicle charging software and services. We, our  
2 software runs what will soon be the largest public DC  
3 fast-charging network in North America. We do not  
4 manufacture hardware. We focus on software, and we  
5 provide turnkey solutions using others' hardware and  
6 off-the-shelf products.

7 Moving on. So, as many have talked about so far  
8 today, we believe that, you know, electric vehicle  
9 charging load is extremely beneficial to the grid if  
10 it's managed intelligently, if it's integrated into the  
11 grid in an intelligent way, and that's largely  
12 predicated on good load management, and we see managed  
13 charging as being the key to that. Move on.

14 So these are some of the benefits that we  
15 associate with electric vehicle managed charging, and  
16 I'll just comment that our perspective differs a little  
17 bit from Plug In America with respect to the value.  
18 We, in our opinion, if we are developing the  
19 infrastructure and the infrastructure's going out  
20 there, it should not be dumb infrastructure. It should  
21 have the capabilities of being able to provide value to  
22 the grid, and it should be done through a lens of  
23 maximizing benefits while minimizing costs as opposed  
24 to through a strict cost-benefit analysis.

25 We'll also note that a lot of the benefits, when

1 people kind of talk about vehicle-to-grid integration  
2 and V2G two-directional flows of energy, we see that a  
3 little bit as kind of like a bright, shiny object in  
4 these conversations. The lion's share of the value can  
5 be delivered through one-way V1G smart and managed  
6 charging.

7 Now, while there's certainly some use cases out  
8 there that are promising with respect to V2G, it's  
9 officially in the context of fleets where there's a lot  
10 of load in a certain location. There's the stuff that,  
11 you know, throughout the country that places are  
12 piloting. You'll see oftentimes school buses is a good  
13 example of that where you have a bunch of school buses  
14 that are sitting around in the middle of the day, and  
15 they can be used as a grid resource. But, generally  
16 speaking, if you're talking about residential, the kind  
17 of charging you're talking about in this context, it's  
18 something that we can kind of table for now while  
19 focusing on smart and managed charging mostly. So move  
20 on.

21 COMMISSIONER CHENEY: Before you move on,  
22 your second-to-last bullet, "Technology is the key to  
23 these benefits", are you talking about current  
24 technology or both current and hoped-for or anticipated  
25 technology?



1           MR. KARLEN:  So, I mean, our view is that, in  
2   order to deliver on these tremendous benefits of  
3   transportation electrification, it's predicated on  
4   using advanced technology, both hardware and software.  
5   That's the key to unlocking the value, and that's,  
6   whether it be through rates, whether it be through  
7   managed charging, whatever that is, that's the key  
8   foundation for making it happen.

9           It's also why our perspective differs a little bit  
10  in terms of how it should be deployed.  We do want to  
11  see those capabilities out there, not just now, but in  
12  the future, and we think that putting chargers out  
13  there that don't have this kind of baseline and  
14  developed capabilities is the wrong approach.

15           CHAIRMAN ROISMAN:  Does your software allow,  
16  let's say, a utility in Vermont like a GMP that has a  
17  fairly large area and parts of that area have very  
18  different needs in different times than other parts of  
19  the area, does it allow for the calibration so that  
20  GMP, if they had all that software in place and all  
21  those chargers out there, could change for different  
22  areas of the state at different times?

23           MR. KARLEN:  "Yes", is the short answer.

24           CHAIRMAN ROISMAN:  Good.

25           MR. KARLEN:  At our core we're a software

1 company, and we pride ourselves in having  
2 market-leading software in that regard. When I  
3 referenced earlier, you know, the network that we're  
4 going to run, I mean, we're providing all that software  
5 and network services for Electrify America's DC  
6 fast-charging network that they're deploying, and  
7 there's a reason why we are doing the network for them.

8 We can move on. So this largely gets at some of  
9 the topics that I'll be touching on later in that  
10 earlier and also some of the topics that these other  
11 presenters and Green Mountain Power was talking about,  
12 so I won't belabor these points, and we can move on and  
13 get into the details of this later.

14 Same story here. These are benefits that we see  
15 with transportation electrification and smart and  
16 managed charging and that we believe, you know,  
17 hardware that's being deployed should have those  
18 capabilities to be able to leverage the variety of  
19 benefits that we can get into later in the afternoon.

20 I'll use this slide to kind of illustrate our, you  
21 know, view that, in order to realize these benefits,  
22 you know, you have technology on one hand being very  
23 key, but you also have the other key aspect of having a  
24 very actively and central utility role in developing  
25 these capabilities. If there is no kind of central

1 smart, intelligent management, both of these, the  
2 program design and also its implementation, those  
3 benefits aren't going to accrue easily. So we just  
4 want to keep that in mind in the context of what  
5 utilities' role should be in this marketplace and how  
6 they are key in making sure that these benefits accrue.

7 We're good. We can conclude here. This is the  
8 last slide here, and this starts to get into some of  
9 the nuts-and-bolts technical details, but we see that  
10 there's a very key and fundamental technical  
11 consideration that needs to be considered, and that's  
12 the role of open standards in having interoperable  
13 hardware and software.

14 This was a pretty hard lesson in this industry  
15 when, not that long ago, the, the consequences of when  
16 you have proprietary hardware and proprietary software  
17 where, you know, car charger A can only speak with  
18 software A and they can't be swapped out, and what we  
19 see is pricing open standards such as Open Charge Point  
20 Protocol, OpenADR across both the hardware and software  
21 as being the key to managing stranded asset costs, and  
22 also just for encouraging competition and choice with  
23 respect to the hardware and software.

24 So we see there is being an opportunity for  
25 competition, innovation, and choice, not just at the

1 initial up-front purchase decision of that hardware or  
2 software, but also for ongoing competition. So, if a  
3 utility or a site host has the flexibility of being  
4 able to swap out their hardware or swap out their  
5 network service or their software, that provides for  
6 perpetual competition for that business.

7       Whereas, if you are locked into a certain  
8 provider's hardware and software at that initial  
9 purchase decision, which oftentimes might come with,  
10 you know, a maintenance and service contract that  
11 oftentimes several multiples of the actual charger  
12 itself, that locks the customer into their initial  
13 decision. We want there to be flexibility throughout  
14 the entire life of the hardware and software. And,  
15 with that, I'll -- if you have any questions.

16       MR. ALLEN: I just want to be clear. Are  
17 there things that, you know, either the legislative or  
18 regulatory apparatus should be doing to positively  
19 affect outcomes related to open standards?

20       MR. KARLEN: Yeah, I think there is. In the  
21 context of programs and directions that commissions  
22 like this are giving to utilities, they can encourage  
23 that industry-accepted open standards are used in the  
24 context of utility-funded, ratepayer-funded, publicly  
25 funded programs. Yeah, I'll leave it at that. Does

1 that answer your question?

2 MR. ALLEN: Yeah, that's fine. Thanks.

3 MR. O'CONNOR: I'll just clarify. We weren't  
4 saying put in dumb chargers. We were saying, before  
5 you acquire capabilities, understand approximately the  
6 cost and benefits within the lifetime of the ones  
7 you're putting in now. So, you know, a 2040 prediction  
8 is not going to be useful for the system you're putting  
9 in now. Yeah, all we're saying is, Look at the cost  
10 benefits. We're not saying be dumb.

11 MR. KARLEN: And we agree with the  
12 high-level, yeah, we should all be cognizant of costs  
13 and benefits, but that shouldn't be the only baseline  
14 consideration. There's a lot more going on here.

15 MS. LEVINE: This may a dumb question, but  
16 I'm going to try it anyway. I'm assuming that, that  
17 the chargers that Greenlots have are more sophisticated  
18 software than, for instance, what Plug In America has.  
19 Is that correct?

20 MR. O'CONNOR: We don't make chargers, but,  
21 like, what I have in my garage is just an outlet.

22 MS. LEVINE: But I'm thinking of a public  
23 charging station or -- okay. You don't do -- okay. So  
24 are you all -- I'm trying to figure out the  
25 differences, and it seems, and from -- it seems to me

1 that you, that the Greenlots has a more sophisticated  
2 software, maybe, maybe not. If it is, is it more  
3 expensive, and, if so, how much more? I'm trying to  
4 figure out how I can determine the value.

5 MR. KARLEN: Right. So, just to kind of --  
6 Plug In America is an advocacy organization. They  
7 don't manufacture or participate in the marketplace at  
8 all in that regard. You might be thinking of Electrify  
9 America, which is, you know, using all the VW  
10 settlement funds to develop infrastructure across this  
11 country. They're a motivated buyer with money to spend  
12 and, you know, through competitive solicitations choose  
13 the products and services that they want to use.

14 With respect to the capability of our hardware and  
15 software, we have plenty of competitors -- one of  
16 them's right across the table from here -- who provides  
17 these value peak, these new products as well. So I  
18 don't think in this venue we can get into the details  
19 of costs and whose costs what and being able to, say,  
20 you know, equalize one and compare against the other,  
21 but, hopefully, it provides a little perspective to  
22 sort of get at your question.

23 MR. O'CONNOR: And our stance is, for the  
24 drivers, we want the money to go as far as possible to  
25 have as many chargers out there, so reducing the costs

1 where we can. We want them to never inconvenience a  
2 driver who needs a charge. No one wants that. I mean,  
3 everyone's on the same page there. That's, you know,  
4 strong in our point of view.

5 CHAIRMAN ROISMAN: And I think the question  
6 was, without getting into the details, What percentage  
7 of the cost of the charger is this addition of the  
8 software that you're talking about? Is it 5 percent of  
9 its cost or 25 percent or something else, just roughly?

10 MR. KARLEN: That's a good -- and that's  
11 varies entirely on the context if we're talking public,  
12 fast-charging, Level 2, what have you, since there's  
13 wildly varying costs in terms of both the hardware and  
14 also the software. I don't have those figures right  
15 now to give you, but perhaps that's something that  
16 Kevin can illustrate as well.

17 MR. MILLER: I'm happy to take your crisp  
18 dollar bill.

19 MR. KARLEN: Yeah, exactly. But I'll get  
20 into those details in the afternoon, but I'll wrap up  
21 with that and look forward to getting into each of the  
22 different issue areas when we get to the discussion.

23 COMMISSIONER CHENEY: Great, thank you. Did  
24 you have a question? I saw your hand go up.

25 MR. LYLE: Sure. I don't know if now is the

1 right time or later this afternoon.

2 COMMISSIONER CHENEY: Well, if it's possible,  
3 later this afternoon.

4 MR. LYLE: Rate design issues?

5 COMMISSIONER CHENEY: Yeah, we will  
6 definitely get into that, and, since we have one more,  
7 the competitor across the table -- Kevin, you're next  
8 -- if you don't mind --

9 MR. LYLE: Yeah.

10 COMMISSIONER CHENEY: -- we will get into  
11 that in depth. So the floor is yours, ChargePoint.

12 MR. MILLER: Okay. I will set a timer for  
13 myself and try and keep in line, and, please, hurry me  
14 as necessary. So I agree with a lot of what Erick  
15 said. I agree with a lot of what has been said before.  
16 I think it's really exciting. Really appreciate the  
17 Commission's continued focus. I'll try and cut to the  
18 point. I cut out some of my presentation where it was  
19 duplicative, so I'm kind of winging it, but if we could  
20 go to the next slide.

21 ChargePoint is a leading network and equipment  
22 manufacturer for EV charging equipment and services.  
23 We manufacture, design, and provide EV charging  
24 equipment for Level 2 and DC fast charging, and we also  
25 provide a network service that is usable by site hosts



1     who purchase and install EV charging stations as well  
2     as the drivers who use our network to access the  
3     stations, and we are focused on having an open network  
4     that's accessible from multiple points to make it as  
5     seamless as possible for site hosts, drivers, no matter  
6     what equipment they're using and no matter what  
7     membership they might have.

8             We think that it's very important for any system  
9     to be able to connect to our network through the Open  
10    Charge Point Protocol. We think it's critical that we  
11    should be able to configure any charging station to  
12    function, and we think, ultimately, what's most  
13    important is that any driver should be able to access  
14    any charging station, and so we've partnered with  
15    Greenlots, with EVBox, with FLO to create roaming  
16    agreements where they can use their charge network  
17    membership to access one of our competitors' networks  
18    and vice versa to make it as easy as possible to get a  
19    charge.

20            Next slide, please. So one of the pieces that I  
21    want to focus on is to provide a little bit of context  
22    about where charging takes place as we start to have  
23    discussions later on during the day about what rate  
24    design should look like and what types of load  
25    management we might want to consider, because no two

1 charging loads are alike.

2 So charging takes place wherever a vehicle is  
3 parked. You're parking when you arrive at your, your  
4 -- you're charging when you arrive at your destination  
5 as opposed to on your way to a destination, typically.  
6 So, at home and at work, those are places where 90  
7 percent of charging takes place, and you're going to  
8 have the remaining 10 percent take place at destination  
9 locations around town or out of town at a corridor  
10 location, and all of these different use cases bring  
11 different potential site hosts to become charging  
12 station owners and operators.

13 And, if we could go to the next slide, the one  
14 previous. Great. Each of those load profiles -- and  
15 this is just a handful of what some of the different  
16 load profiles on aggregate and not to scale look like.  
17 So in orange is a workplace charging curve which Peter  
18 looked at before. There's a couple of peaks -- this is  
19 over a 24-hour period -- where you see a large peak  
20 when the worker comes in and then a second top-off when  
21 folks switch over at midday and turn over that charging  
22 session.

23 The blue curve is a fleet charging profile where  
24 you start to see folks coming back from a duty cycle in  
25 the afternoon. But no two fleets are alike. So, when

1 we think about our transit fleets, we need to think  
2 about those a little bit differently than we might  
3 think about transportation networking companies.

4       There are ways to aggregate these fleets, but the  
5 way in which you incentivize them derives some of that  
6 value that Peter was speaking to, and it's important to  
7 think about, What are the ways in which the  
8 transportation habits are happening? Because,  
9 ultimately, there are battery-like qualities to  
10 electric vehicles, but, unlike stationary storage,  
11 these things have wheels, and they need to be able to  
12 use them, so we don't want to disincentivize that use.

13       And we've talked a lot about home charging, which  
14 is that green load profile where we see a big spike  
15 towards the evening when -- this is taken from a San  
16 Diego Gas & Electric load curve where a super off-peak  
17 period hits at about 11:00 p.m., and you see a large  
18 spike. So just to characterize those different types  
19 of loads.

20               COMMISSIONER CHENEY: So I'm curious what the  
21 actual lines represent. I'm assuming that that isn't  
22 actual load in terms of impact on the grid, but rather  
23 the typical pattern depending on whether the cars are  
24 charging at the workplace or at home, for example?

25               MR. MILLER: That's correct. I mean, it's

1 the charging behavior. It's the kilowatt-hour  
2 consumption.

3 COMMISSIONER CHENEY: All right, thanks.

4 MR. MILLER: Okay. Next slide, thanks. So  
5 one of the key pieces to think about in terms of how  
6 site hosts themselves incentivize charging behavior is  
7 the price that they set. So I'm not going to read  
8 through all of these lines, but the site hosts are  
9 typically using a price for EV charging to incentivize  
10 that charging behavior. It can take place in a number  
11 of different ways, combinations of those ways from a  
12 free charging session to energy rates to length-of-stay  
13 pricing.

14 This can be differentiated by different driver  
15 groups. So you could have an employee rate versus a  
16 visitor rate versus a rate to the public, all of which  
17 can be communicated, but ultimately having that  
18 flexibility to incentivize driving behavior is really  
19 critical, and so there are definitely instances in use  
20 cases in which direct load management taken out of the  
21 hands of a site host is arguable, but there are also  
22 cases in which that would be counterproductive.

23 You know, for example, if you're looking at a  
24 public location which has typically less predictable  
25 charging behavior, you would create a negative

1 experience for the driver if you prevented them from  
2 charging at a certain period of the day, time of day,  
3 and you would have little value from, for example,  
4 calling a demand response event at a public station  
5 wherein you weren't going to have that consistent load.

6 Next slide, please. This is a great study which I  
7 just wanted to flag for the Commission. It looked at  
8 400,000 workplace charging sessions, and it identified  
9 what are the most efficient pricing policies to  
10 incentivize optimal charging behavior. The least  
11 efficient policy is free. It leads to folks parking  
12 and charging and staying once the charging session is  
13 complete. There's no incentive to turn over the asset.

14 The most efficient would be a combination of a  
15 kilowatt-hour rate, plus a time-of-stay fee or an  
16 hourly fee thereafter to incentivize that turnover. So  
17 thinking about how those options work together is  
18 important, and thinking about, Are you ensuring that  
19 the operator of the charging station who has more of a  
20 direct relationship with the driver is able to  
21 incentivize that driving behavior?

22 Next slide, please. We don't have to go through  
23 all of these different lines of interest, but I just  
24 want to call out again to the point that I'd been  
25 making earlier that it's important to consider, when

1 thinking about load management, rates for EV charging  
2 services, whether they are directed to drivers directly  
3 or to the site hosts. It's important to consider all  
4 the different interests at play when creating those  
5 pricing. So, you know, the driver is interested in  
6 having availability of a charging session, you know,  
7 consistent experiences. On the whole, very important  
8 to just make sure that we're not ignoring some of these  
9 key stakeholders as part of that charging ecosystem.

10 Next slide. This is to pivot to an issue that  
11 we'll speak to later, so I can hold on this. This is  
12 just a snapshot of all the different ways in which  
13 payment can be processed for a charging session. It's  
14 a rapidly shifting series of technologies, and, as we  
15 continue to see new payment options from the credit  
16 card industry, for example, who have gone from magnetic  
17 swipe to chip to contactless. We have other options  
18 that are available as well for mobile devices. It's  
19 important to make sure that we're thinking about how to  
20 be responsive without pegging ourselves down to any one  
21 specific payment technology.

22 Next slide, please. This is just pointing out  
23 open access laws that support multiple payment options.  
24 I think it's pretty much repetitive of the previous  
25 slide, so, if we could go to the next slide, this is,

1 for the record, just pointing out some of the statutes  
2 in Connecticut, Mass, and New Hampshire that talk about  
3 the need to have flexible multiple payment options to  
4 ensure public accessibility.

5 Next slide, please. These are questions that I  
6 just wanted to flag for the Commission to potentially  
7 keep in mind as we think about what is going to be the  
8 most sustainable way forward to ensure continued  
9 highway and transportation fund revenues to support,  
10 you know, horizontal infrastructure moving forward.  
11 We've seen a number of different approaches take place  
12 around the country, considerations of vehicle miles  
13 traveled, registration fees as a means to recover EV  
14 road use, or, as is being considered this week, if not  
15 right now, Should a fee be assessed on a  
16 per-kilowatt-hour basis to support revenue for  
17 transportation?

18 And what I just would point out is that, instead  
19 of picking one, it's important to think about a series  
20 of questions and have that informed policy, and so the  
21 ones that I'd recommend would be, First, will all  
22 drivers pay an equitable and fair share for maintenance  
23 as a result of this policy, or could it, in effect,  
24 inequitably impact one type of driver?

25 There is a proposal in Iowa where, based on some

1 of our calculations, a per-kilowatt-hour fee for  
2 highway revenue on EV charging is proposed which would  
3 lead to an inequitable, much higher impact on EV  
4 drivers than for non-EV drivers. So, you know, that's  
5 an example of where having that focus can be important.

6 One key here was the next question, Are you going  
7 to be able to ensure compliance with the  
8 revenue-generating mechanism? If you're setting, for  
9 example, a fee on a per-kilowatt-hour basis for  
10 charging to fund highways, if you can't track it, if  
11 you can't ensure that it's happening, if it's happening  
12 behind the meter on a Level 1 charger, or, if there are  
13 other ways around that, that's not going to be a  
14 sustainable path forward.

15 We've talked about in the previous session the  
16 consumer protection requirements, looking at weights  
17 and measures and those pieces. I think those are  
18 important to consider and aren't always. Some of the  
19 technological barriers to robust implementation really  
20 do need to be considered. To what extent is, are these  
21 options implementable now looking at VMT versus fees  
22 versus registration?

23 And then, finally, are we actually solving the  
24 long-term problem? What is the problem that we're  
25 trying to solve? Is it just ensuring that we continue



1 to have roads paved, or, if we're looking at a future  
2 where transportation electrification is a meaningful  
3 part of our mobility in Vermont, are we also avoiding  
4 future costs by making sure that that infrastructure is  
5 EV-ready?

6 So an example of how this is taking place is in  
7 Colorado. They've set an EV registration fee of \$50  
8 which is split between a highway tax fund and an EV  
9 grant fund which pays for public EV charging. So how  
10 are we thinking about the type of transportation  
11 infrastructure that we need? And I think I'm at 12  
12 minutes, and I think that's it. So I tried to speed  
13 through. Thank you very much.

14 COMMISSIONER CHENEY: You packed a lot in.  
15 Thank you. If there are no questions for Kevin --

16 CHAIRMAN ROISMAN: I have one question that's  
17 not uniquely to Kevin that I would be interested in for  
18 perspective. If we were at 50 percent of all the cars  
19 in the state of Vermont or nationally electric, what  
20 portion of the total electric load would that  
21 represent?

22 MR. MILLER: I know that there are studies to  
23 that effect.

24 MR. O'CONNOR: I have a back-of-the-envelope  
25 which is X over 4. If all light-duty vehicles were

1 electric, that would be a 25 percent increase in  
2 electricity consumption, roughly. So you divide the  
3 penetration by 4, and that's a ball park estimate for  
4 your increased generation. That might not reduce the  
5 peak by that much, hopefully. But X over 4 is my ball  
6 park number. I can show you the numbers for that.

7 CHAIRMAN ROISMAN: Okay. So that's helpful  
8 just to get an idea. We're not talking about a tiny  
9 change; we're talking about an enormous change.

10 MR. MILLER: Could I be so bold as to try to  
11 answer some other questions or speak to --

12 (Simultaneous speaking.)

13 COMMISSIONER CHENEY: Wait. Let's all talk  
14 one at a time for the court reporter's sake. And we  
15 have a phone call, so let's hold. Would you please  
16 identify yourself for the room? We've a got a packed  
17 room here.

18 MS. CONNORS: Sure, yeah, this is Molly  
19 Connors.

20 COMMISSIONER CHENEY: And you're with ISO New  
21 England.

22 MS. CONNORS: I apologize for the  
23 interruption.

24 COMMISSIONER CHENEY: And, just to warn you,  
25 we're about to take a break, so we're coming to the end

1 of the first part, and we had -- who was first with a  
2 question here? Kevin, did you want to --

3 MR. MILLER: I was just hoping to respond to  
4 prior questions that came up, and so there was one  
5 question about vehicle-to-grid and what are the  
6 limiting factors there, and I would agree that  
7 challenges on the vehicle battery side are problematic,  
8 but, just to clarify that, you know, ChargePoint's  
9 hardware can participate in a vehicle-to-grid future.  
10 It's something that we're exploring. We've got --  
11 we're participating in a pilot project with Con Edison  
12 where a school bus vehicle-to-grid pilot is being  
13 pursued. So we have the capability, but it's, it's not  
14 a question of one magic bullet. All of these pieces  
15 have to work together.

16 And there was also a question about what happens  
17 even in a neighborhood as we see more, on a Vermont  
18 basis, when you have more EV adoption in certain areas?  
19 I think one of the key things to think about there is,  
20 How are we making sure that all of the utilities are  
21 able to have visibility into that charging behavior?  
22 And, by having that smart-charging solution, you can  
23 manage right at a circuit level. You can manage, you  
24 can only manage what you can measure, and providing  
25 visibility with smart charging, that is to say, is a

1 critical step.

2 COMMISSIONER CHENEY: And, as to the 100  
3 percent of vehicle adoption leading to 25 percent in  
4 energy consumption, I noticed in your comments you  
5 said, just to give another angle to your question, you  
6 also said, at a 20 percent light-duty vehicle adoption  
7 rate, there would be a 5 percent increase or a  
8 representation of energy consumption.

9 MR. O'CONNOR: Right. So the penetration  
10 divided by 4 is about the increase in overall energy  
11 consumption or generation. That could be all off-peak.  
12 You couldn't do on valley filling at that level and not  
13 increase your peak at all. And I can go through the  
14 numbers really quickly if you have time.

15 Light-duty vehicles are about 3 trillion vehicle  
16 miles a year. You get roughly 3 miles per  
17 kilowatt-hour. So that would mean you'd need 1  
18 trillion kilowatt-hours in the US, and, currently, we  
19 use about four trillion kilowatt-hours. So 100 percent  
20 of light-duty vehicles being EVs is about a 25 percent  
21 increase in electricity consumption using those  
22 estimates, back-of-the-envelope approximations.

23 And then you can just prorate your actual fleet  
24 penetration. So, if in 2050 you have 100 percent EVs,  
25 by that point you have a 25 percent increase in

1 electricity consumption, but you've had decreases from  
2 energy efficiency, so you might even just be flat when  
3 you account for all that. You know, you can probably  
4 talk more about that, your projections, but those are  
5 my --

6 MR. KARLEN: I would just add really quickly  
7 there. So the right person in the room to do the  
8 back-of-the-envelope calculations. That's great. But  
9 it's not just the aggregate increase in demand; it's  
10 the using the utility system more efficiently and being  
11 able to fill in those gaps and valleys. As every  
12 utility can, you know, attest to declining load, in the  
13 context of that, this is, like, the one big opportunity  
14 to kind of counter that trend.

15 COMMISSIONER CHENEY: Right. So it's a lot  
16 more subtle than just the percentage usage, yes.

17 MR. KARLEN: Exactly.

18 MR. LYLE: Yes, thank you. Tom Lyle, with  
19 Burlington Election. If I could put Mr. O'Connor's  
20 national statistics into a hyperlocal context, another  
21 way to look at it is the way we kind of look at it. If  
22 the EV customer, the EV driver, drives, you know,  
23 10,000 miles a year, he's going to roughly consume  
24 about 3,000 kilowatt-hours. The average residential  
25 home in Burlington consumes between 4,000 and 5,000,

1 maybe a little bit less depending on, little bit more  
2 depending on the size. So it's a little bit more than  
3 25 percent added load. Having said that, though, it's  
4 all a good thing so long as people charge at night in  
5 terms of, like, the network.

6 COMMISSIONER CHENEY: And that's where the  
7 subtlety comes in. Okay. We're going to break now.  
8 Let's take 15 minutes. So we'll be back at 15 minutes  
9 after 11:00 or 1 minute after 11:00. Thank you.

10 (A recess was taken from 10:45 a.m. to 11:01 a.m.)

11 COMMISSIONER CHENEY: All right. We'll get  
12 going again. So our plan is to start with the first  
13 topic related to electric-vehicle-specific rate  
14 offerings, and our question, when we sent out  
15 information requests for this workshop was, "In regard  
16 to planned or currently available EV-specific rate  
17 offerings for both home charging and service to the  
18 public charging stations, how they will be or are being  
19 implemented, how successful the offerings are expected  
20 to be or have been, and any difficulties expected to be  
21 encountered or that have been encountered in offering  
22 such rates". So we'll start with some questions from  
23 the front of the room.

24 MR. KNAUER: So, yeah. My take from reading  
25 VEC's comments is you don't have an EV-specific rate

1 right now. My takeaway is that you think your  
2 time-of-use rate is good enough. Am I reading that  
3 correct?

4 MS. COHEN: Andrea Cohen, Vermont Electric  
5 Cooperative. We're in the very early stages of these  
6 programs, and we're trying to, you know, get feedback as  
7 we're going along, but we do, for any Tier III  
8 participant, which would include the EV incentives, we  
9 offer the time-of-use rate, and folks are taking us up  
10 on that. We'll have to report back with, you know,  
11 more information, but in 2018 we had 33 members that  
12 took advantage of the EV, the full EV incentive, and we  
13 had 25 plug-in hybrids in a rural territory.

14 So we're offering the time-of-use rate as just an  
15 opportunity, and we're just going to, like, learn as  
16 we're going along. We don't have anything specific to  
17 just an EV charging rate. We have the whole account on  
18 the time-of-use rate.

19 MR. KNAUER: Can you remind me of the details  
20 of how that rate works?

21 MS. COHEN: Yes, but I might, it might take  
22 me a minute to find, because I'm not the rates person.  
23 So I might have to get back to you on that.

24 MR. KNAUER: That's fine.

25 COMMISSIONER CHENEY: You let us know when

1 you have the answer, and then we'll turn back to you.

2 MS. COHEN: Thank you.

3 MR. KNAUER: And I just had a kind of a  
4 general question. From the utility comments, it sounds  
5 like everyone is still manually take -- I think this is  
6 BED and GMP. You're taking the EV-specific usage data  
7 and manually incorporating that into your billing  
8 system.

9 COMMISSIONER CHENEY: And I see nodding  
10 heads, yes?

11 MR. OTLEY: Yes, that is correct. At this  
12 point in time, because it's such a low penetration, we  
13 have not done the upgrades to our billing systems to  
14 incorporate that logic programatically.

15 MR. KNAUER: All right. And so, presumably,  
16 you want those programs to be very successful, but at  
17 what point do you get overwhelmed in terms of having to  
18 do it manually?

19 MR. OTLEY: Well, it depends on, it's going  
20 to ultimately depend on where we land and the  
21 complexity of the mechanism we land on for how we do  
22 this. At the -- you know, we're still, we're still  
23 piloting stuff, and so, you know, with the limited  
24 scope of the pilot, we're not going to do software  
25 customization to these systems until we're more sure



1 where the, where the, you know, this is all leading and  
2 we can have some firm, you know, guidelines in what  
3 we've got to program.

4 MR. KNAUER: That makes sense.

5 MR. COTTER: Are you confident that, if  
6 things are successful and you get to whatever that  
7 number is, 1 percent, 2 percent, 5 percent of your  
8 customer base, that you will be able to, in a timely  
9 fashion, implement that kind of technology upgrade?

10 MR. OTLEY: Yeah, we're pretty confident.

11 MR. TURK: And all the charging providers  
12 that we work with, they collect data. It's on  
13 five-minute very fine-tuned intervals, and so we have  
14 that data right now. It's just not integrated with our  
15 billing system to streamline.

16 MR. COTTER: I mean, we've heard some  
17 comments that the data that is collected by the smart  
18 chargers might not play well with the billing systems  
19 that the utilities are using, but you're not  
20 anticipating any problems with incorporating that data  
21 into your billing system?

22 MR. OTLEY: I don't, I don't -- I can't say  
23 100 percent, but I think it's, I'm, that, it's not a  
24 big concern. The bigger concern for us is, Where,  
25 where will this whole concept go and what, what

1 mechanisms and what structures will get agreed upon  
2 that we can then implement for a longer term?

3 MR. COTTER: Okay. That's good to know.

4 COMMISSIONER CHENEY: By structures do you  
5 mean financial requirements such as perhaps the levy of  
6 a fee or a tax on -- what do you mean by what kinds of  
7 structures?

8 MR. OTLEY: Yeah. So, if it's -- so, if  
9 there, you know, as we were talking about with VEC,  
10 right, VEC's got an existing time-of-use rate that  
11 they're using to incent EV charging, but that's a whole  
12 account rate, not just an EV charging rate, right? So  
13 is that, is that going to win the day and be the most  
14 prominently adopted mechanism, or would it be a  
15 time-of-use rate that is only for the EV consumption  
16 and a different time-of-use rate for the rest of the  
17 account, or is it going to be some variant of, like,  
18 the flat fee thing that we tried that we've learned a  
19 bunch on but don't think we'll keep going? Or maybe it  
20 will be a hybrid of the two.

21 I mean, once all the different possibilities  
22 narrow down to the meaningful few, then that's when you  
23 start thinking about doing programmatic changes to your  
24 billing systems, not before that. And I don't know if  
25 that's based on the number of customers participating

1 or the number of pilots that have been tried or some  
2 sort of regulatory feedback that we've been given to  
3 narrow the scope of what's being experimented with down  
4 to the meaningful few. Yeah, it's all of that.

5 COMMISSIONER CHENEY: So, BED, you want to  
6 chime in? And then it looks like Andrea Cohen has an  
7 answer.

8 MR. LYLE: Sure. Okay, yeah. Tom Lyle with  
9 Burlington Electric. I just want to go back to the  
10 point about integrating this, the data that's streaming  
11 out of all of the publicly available chargers and home  
12 chargers and things like this that -- I, I take it that  
13 GMP is a little bit more confident than we are,  
14 Burlington Electric, and I believe VPPSA as well, the  
15 VPPSA utilities. We're not as, as confident as GMP  
16 seems to be right now in terms of handling the what we,  
17 you know, anticipate being an, an overwhelming amount  
18 of, of data.

19 You know, we're talking, for at least BED, we're  
20 talking about 15-minute interval data. How do we  
21 migrate that data into our MDM systems and then out of  
22 the MDM systems, management data systems, into our  
23 customer billing system and present those, those  
24 credits, if you will, or present a, at some point in  
25 time, a rate to customers?

1           So, you know, you've got ChargePoint, you know,  
2     presenting, Greenlots, FLO, you know, I don't know how  
3     many other vendors that are out there, you know, all  
4     vying for, for market share. These are all different  
5     types of companies, all different types of data systems  
6     that we would have to, to handle, manage. They all  
7     have their quirks. I think we've pretty much laid out  
8     the arguments or the concerns that we have in our last  
9     filing.

10           The only other thing I, I would also add is that,  
11     while GMP has the, may have the wherewithal to kind of  
12     manage that, that data system, they also have the  
13     scale, they also have the scale, the number of people,  
14     the capital behind them to be able to afford those type  
15     of systems and those system upgrades and pass those  
16     costs on to their customers of -- I'm going to get this  
17     wrong -- but, you know, thousands of customers, whereas  
18     we only have 20,000 customers. So it's a different  
19     scale, I think. So I'll leave it at that.

20           CHAIRMAN ROISMAN: Let me ask a question  
21     related to that. We have two companies here, one of  
22     which provides only the charging software and one that  
23     provides the hardware and the software. Is it a  
24     feasible add-on to your software technology to provide  
25     the companies who put your chargers into their

1 territory with the interface to their billing system so  
2 that it doesn't become a cost that they have to incur  
3 to use the system but it's part of the package?

4 MR. MILLER: I'd say that, eventually, at the  
5 end of the day, in addition to what a utility deploys,  
6 there's going to be a lot that's on the grid  
7 regardless, and there will be a need to be able to draw  
8 in data to manage, right, the charging that's going on  
9 and to first have visibility into it. So, you know, we  
10 try to work with our utility partners to make sure that  
11 the data that we provide through APIs is accessible and  
12 meets their needs, and we'll always try and make that  
13 as open and accessible as possible, but, ultimately,  
14 there are always going to be more new companies out  
15 there. So I think it's going to be an issue that has  
16 to be addressed on both ends of the relationship.

17 CHAIRMAN ROISMAN: That's not quite the  
18 question I was asking.

19 MR. KARLEN: I'll take a stab at it. So,  
20 first of all, what we provide is software network  
21 services, but we also provide turnkey solutions with  
22 respect to charging using other people's hardware and  
23 such. So we provide the spectrum of services. Just  
24 want to clarify that point.

25 But it is no joke that there are difficulties when

1 you're integrating, you know, one software system with  
2 a billing system on the back end, and, generally, in  
3 the pods we've seen, that, that ends up being the  
4 issue. It's not metering accuracy. It's nothing  
5 technically. It's like the exception management in the  
6 billing system, aligning interval data from one with  
7 the other as in the subtractive billing. It's that  
8 sort of complexities.

9 And, I mean, there's several ways that you can  
10 mitigate this. A, you don't go and use six different  
11 vendors' different, you know, networks and software.  
12 You pick one or two, or you pick one to kind of manage  
13 it, and then other people's hardware can speak with it.  
14 There's a variety of ways that you can kind of simplify  
15 that down.

16 Another approach is, especially if, for a utility  
17 that's getting into managing EV charging load, is you  
18 start by not doing, using the embedded meter within a  
19 charger for billing purposes. So you can induce the  
20 beneficial charging behavior for a smart-charging  
21 program where the customer gets the, the cost for  
22 charging and they know how many kilowatt-hours they've  
23 used on a submetered load, but you don't use that  
24 submetering data for billing purposes, and you instead  
25 induce the charging behavior through a managed

1 smart-charging program where there isn't a need or bar  
2 to pass with respect to accuracy and billing for  
3 revenue billing purposes that you're all familiar with.

4 So there's a variety of kind of approaches you can  
5 use to kind of get your feet in the water, especially  
6 with utilities with perhaps fewer resources.

7 COMMISSIONER CHENEY: So, Andrea Cohen, are  
8 you ready?

9 MS. COHEN: Yeah, I'm sorry. I found what I  
10 was looking for. Sorry for the delay. So we have  
11 three periods on our rates for the time-of-use rate.  
12 We have the off-peak, the mid-peak, and the on-peak.  
13 The off-peak is weekdays starting at 9:00 p.m. through  
14 7:00 a.m. The mid-peak is 7:00 a.m. to 5:00 p.m., and  
15 the on-peak is 5:00 p.m. to 9:00 p.m., and the off-peak  
16 also includes holidays and weekends, and the rates that  
17 follow from that, actually, the difference between the  
18 off-peak and the on-peak, it's almost three times more  
19 expensive to use on-peak.

20 So, rounding, it's about 12 cents per kWh  
21 off-peak, 17 mid-peak, and 32 on-peak. So we're hoping  
22 that these blocks and these incentives will change  
23 behavior, especially things that are, you know,  
24 flexible like charging your vehicle.

25 MR. MILLER: Can I go back to the Chair's

1 point? I just want to cite that I agree with Erick  
2 that it's important to explore off-bill incentive  
3 mechanisms. Like, Con Edison has a rate that can be or  
4 has an incentive program that is implemented by  
5 providing a rebate on a retroactive basis for charging  
6 behavior that takes place during certain hours. So  
7 there's an, an option for either an on-board vehicle  
8 mechanism, or you can manage that through a charger.  
9 So that helps to incentivize charging without dealing  
10 with the back end.

11 But one of the points that I would take a  
12 different tack on is I'd caution against leaning into a  
13 solution where a utility for its service territory  
14 would pick one network service provider as being a,  
15 potentially, a limiting and restrictive choice when we  
16 have so many rapid changes in technology taking place  
17 that you don't want to put your thumb on the scale in  
18 that market, because that could have unintended  
19 consequences.

20 MR. TURK: Graham Turk, Green Mountain Power.  
21 I would just add to that point. We do have, in  
22 addition to the unlimited plan, a "Bring Your Own  
23 Device" program where there are three chargers  
24 currently available, and you can get a \$10 bill credit  
25 by enrolling that in our device management system.



1           Those are not on a separate billed plan, and so  
2           that, to Erick's point, it, it is the management and  
3           the signals but not using it for billing purposes, and  
4           that's to give as much flexibility as we can. If we  
5           were to integrate all those systems on the billing end,  
6           it would require going to each of those vendors and  
7           setting up the back-end integration.

8           MS. BAILEY: Melissa Bailey with VPPSA. I  
9           just wanted to flesh out VPPSA's position on the data  
10          integration with regard to the billing systems. I  
11          think we are optimistic that there is a technological  
12          solution but that would come at a cost, and we're,  
13          consistent with what some other folks have mentioned,  
14          we've been having preliminary conversations with a data  
15          platform vendor about control of devices and that that  
16          can be done at a relatively low cost, so managing the  
17          load through direct control as opposed to potential of  
18          different rates or, you know, potentially separate  
19          metering for EVs.

20          So, again, our concern is really around the cost  
21          and the cost benefit of doing the data integration with  
22          billing systems and whether that cost would be borne by  
23          EV drivers, then presenting a disincentive for adoption  
24          versus ratepayers as a whole, which, again, raises  
25          concerns. So, again, just wanted to be really

1 cognizant of whether the benefit of doing so is  
2 necessary and outweighs the costs.

3 MR. COTTER: Do any of the VPPSA utilities  
4 have any tariffs in place that would be, you know,  
5 hopefully incentivizing EV charging at certain times?  
6 I know so that VEC has not gotten to the level of  
7 granularity that BED and GMP have, but do any of the  
8 VPPSA utilities have anything in mind like VEC, if not  
9 currently, any plans for the future?

10 MS. BAILEY: Well, I'd defer to our rates  
11 person, who is the room, but I think, around EV  
12 specifically, we just rolled our Tier III program under  
13 the renewable energy standard, and we've been relying  
14 on customer education and voluntary control of charging  
15 with an informational sheet that's sent out when they  
16 do their, when they receive their rebate. But I  
17 believe some of our members may have time-of-use rates.  
18 Steve Farman?

19 MR. FARMAN: I think we have one member that  
20 has some time-of-use rates. I'm not sure what the  
21 details of them are.

22 MR. COTTER: Oh, that's okay.

23 MR. FARMAN: They're not used very much.  
24 They've been around for a long time. I almost think  
25 they're a throwback to time-of-use rates that were put

1 in place back in the 80s or 90s.

2 MR. COTTER: Okay.

3 MR. FARMAN: We don't have any specific EV  
4 charging rates, tariffs. Swanton has one, does have a  
5 -- there was a pilot. There's one tariff. They have  
6 one, a pair of public charging stations in Swanton.  
7 They've been very lightly used. They've been in place  
8 for two years, and they haven't, at this point, hasn't  
9 been enough volume to even cover the credit card  
10 processing fees.

11 MR. COTTER: Right. I saw the report on that  
12 recently. Yeah.

13 MR. FARMAN: That's kind of where we are. We  
14 haven't -- we're sort of waiting for more information  
15 for this to sugar off.

16 COMMISSIONER CHENEY: So I'm wondering, in  
17 terms of the low usage for those chargers, what kind of  
18 sites are they in? Are they, for example, in places  
19 people park for a long time?

20 MR. FARMAN: They're, they're right off of  
21 Exit 21 in Swanton. There's a small gas station, truck  
22 stop kind of facility there, and they're located  
23 somewhere in that, in that lot.

24 MR. ROBERTS: I know where they are. Dave  
25 Roberts, Drive Electric Vermont. They're, Swanton

1 Village has their offices there, and there's a  
2 municipal park-and-ride lot. They're sort of at the  
3 far end of that lot, right off the interstate, though,  
4 and they're Level 2 chargers, not --

5 COMMISSIONER CHENEY: So that incentivizes  
6 parking your electric car and driving an internal  
7 combustion engine car.

8 MR. ROBERTS: Or possibly taking a bus,  
9 although I'm not sure how well that lot is served.

10 COMMISSIONER CHENEY: Okay, thanks. Melissa?

11 MS. BAILEY: I just wanted to make one other  
12 point on, you know, looking at the preferable solution  
13 around -- you know, we may get more into this on the  
14 grid management conversation, but we see direct control  
15 as preferable, especially as we see shifting peaks and  
16 developing time-of-use rates that may potentially  
17 become outdated or not necessarily incentivizing the  
18 right behavior. As a long-term solution, some more  
19 active management seems preferable from our standpoint.

20 MR. TURK: I forgot to mention. The low  
21 opt-out rate we cited earlier, that was for both  
22 customers who are on the unlimited plan and not, and  
23 so, for the ones who are not on the unlimited plan,  
24 they had no financial disincentive. It was just, the  
25 default was to opt into the event. And so interesting

1 anecdote about human behavior, but there was no  
2 financial penalty, and we didn't do any surveying to  
3 dig deeper into that, but just interesting to see that,  
4 when the default option was to participate, very few  
5 people opted out.

6 COMMISSIONER CHENEY: And it takes actually  
7 an act of volition to opt out, so it's more effort?

8 MR. TURK: It does. You have to click a  
9 button in an email that will toggle off the control  
10 mode of the charger, which would otherwise be cut off  
11 during that period.

12 MR. KNAUER: A question for Tom Lyle. I  
13 think your comments said that, for each EVSE vendor,  
14 you've had to negotiate to get access to the  
15 consumption data; is that correct --

16 MR. LYLE: Correct.

17 MR. KNAUER: -- for purposes of doing your  
18 billing reconciliation? Was that -- did GMP have the  
19 same experience and need to negotiate with each vendor  
20 to get access to the billing?

21 MR. OTLEY: I don't know the answer to that  
22 off the top of my head. It's not been a problem. It's  
23 not been a problem area that I've become aware of  
24 operationally for how we're doing it, but I don't have  
25 direct knowledge to know if we are sharing the same

1 suffering that Tom's talking about or not. Sorry.

2 MR. KNAUER: Tom, is it suffering for you?

3 MR. LYLE: Well, not now, because we have  
4 those contracts in place right now. So we're, for the  
5 benefit of the folks in the room, so your strict --  
6 we're talking about the, the residential program, and  
7 we've contracted with, with ChargePoint, FLO, and  
8 Packetized Energy. Nothing's really in place with  
9 Packetized Energy. But we, these companies have, have  
10 claimed ownership over the customer data, and which is,  
11 I thought, was, when I heard this, I thought it was --  
12 I was a little perplexed about this, because our  
13 electricity is going into the home and going through  
14 the charger, yet, because of the ChargePoint device,  
15 the company claimed that they had ownership.

16 So we had to put in contracts in place to actually  
17 make sure that we had access to that data all the time  
18 and that there was no ability for the vendors to cancel  
19 the contract on short notice and, and thereby not  
20 providing us the, the data information.

21 COMMISSIONER CHENEY: Would you like to talk  
22 about that?

23 MR. MILLER: Not having been privy to this  
24 specific negotiation, I can't respond exactly to that  
25 point, but I'd say that there are a number of issues

1 that we would want to be careful and cognizant of  
2 whenever we are talking about the data that is  
3 generated on ChargePoint stations by the drivers on our  
4 network. There's a lot of personally identifiable  
5 information that is included in a charging session from  
6 what type of vehicle it is to where the ChargePoint  
7 member has registered their card.

8 So we want to make sure at all points that, you  
9 know, at a base level, that the information that is  
10 being gathered is the accurate information and that any  
11 one user doesn't inadvertently have access to another  
12 user's data as a station manager. So, again, I think  
13 that there are a range of issues that can and should be  
14 considered, and, if there are takeaways that I can  
15 bring back to the team to make that smoother, that's  
16 great.

17 But to say that there shouldn't be a negotiation  
18 when you have millions and tens of millions of charging  
19 sessions of data at stake where there is personally  
20 identifiable information, I think it is important to  
21 make sure about the parameters of the contract.

22 MR. ALLEN: Can I -- so I just want to be  
23 clear. So from, from your perspective, this is about  
24 kind of protection of information that you don't want  
25 to be disseminated inappropriately, and it's not about

1 property rights as such?

2 MR. MILLER: I gave the broad caveat up  
3 front, again, about, not having been party to that  
4 specific negotiation, I just called out that there are  
5 going to be a number of issues that should be  
6 considered. I gave a couple of examples, and I'd be  
7 happy to follow up and have a further discussion if  
8 there are takeaways that we can add.

9 MR. ALLEN: How do you -- I have, I'm having  
10 difficulty framing the question, but, you know, I think  
11 our initial kind of instinct would be, if it's data  
12 that relates to usage, it's kind of customer  
13 information, and it should be their kind of prerogative  
14 on who should have rights and access to that. How do  
15 you react to that?

16 MR. MILLER: Again, not having been -- I  
17 don't want to keep on giving you the same answer,  
18 Riley. I'm happy to follow up with you. I think  
19 you're bringing up some great points.

20 MR. ALLEN: Okay, thanks.

21 MR. KNAUER: What Greenlots earlier said, you  
22 know, you had some painful lessons in the past, and  
23 you're looking to work towards more open standards for  
24 software and hardware. Does that get to, to Tom Lyle's  
25 point where he, he, at least in the past, had, had to



1     jump through some hoops to get consumption data for his  
2     residential program?

3             MR. KARLEN:  Yes and no.  That comment was --  
4     I mean, I think everyone knows what happened to, like,  
5     the Blink network, right?  Those were sole proprietary  
6     hardware and software, and that was, that company went  
7     bankrupt, and we had all these stranded chargers all  
8     over the place.  That's a pretty firm example of kind  
9     of the implications when you have things that are tied  
10    software to hardware, hardware to software.

11            We'd expect that, you know, these billing and  
12    back-end systems, I mean, we believe that the  
13    customer's data is the customer's data.  With respect  
14    to the, where that owns, falls in the context of a  
15    contract, that, that I can't speak on behalf of pain  
16    points that Burlington has had with certain vendors.  
17    All I can say is that we're not part of that program,  
18    and we do do things a little bit differently.

19            But on payment interoperability, there are a  
20    variety of protocols, and there's a variety of  
21    standards that a system could use, you know, to be  
22    interoperable.  There's OCPI, OCIP, amongst others that  
23    are meant to provide for payment and billing back-end  
24    and interoperability between systems.

25            So without getting too farther into the details, I

1 would, yeah, say that the consideration for using  
2 open-based standards for all software systems is  
3 critical, whether it be on the hardware-software  
4 interoperability side, the billing, data billing side,  
5 wherever that may be.

6 MR. OTLEY: Just to clarify what we said  
7 earlier, the residential charging program we have,  
8 we're using two different types of chargers in the home  
9 to have visibility and control over those events.  
10 Neither one of those integrations from a data  
11 standpoint was difficult for us. You know, we use a  
12 partner who provides us with a control platform to make  
13 those integrations. They're the experts at that. They  
14 worked with the charging companies or the charging  
15 manufacturers to make those connections, and it seems  
16 to work pretty well.

17 The other comment I would make is all of this  
18 stuff at a higher level falls under the concept of  
19 where we think the grid's going, right, which is it's  
20 going to get more dynamic, it's going to get more  
21 distributed, it's going to get more intelligent. And  
22 so I can attest, you know, utility billing systems are  
23 head-scratchingly difficult things to deal with, but  
24 they absolutely cannot be used as an excuse to not move  
25 forward with this stuff.

1           So, you know, we work hard with our, our billing  
2 system vendor to, you know, browbeat them regularly to  
3 help us make the changes we need to keep up with the  
4 ideas and the concepts we're trying to implement. It's  
5 not fun, it's not easy, but that's the work. That's  
6 the work, and if, if we allow those systems to be an  
7 excuse to doing what is necessary to help us combat  
8 carbon and climate change and all the stuff we're  
9 trying to do, then we're just not doing our job. So  
10 you'd better get good at it soon, or you'd better do  
11 something else, because, if that stands in the way of  
12 progress, shame on us. I don't care how big a utility  
13 you are or not. We're all in this room collectively.  
14 On a national scale, we're tiny. So figure it out.

15           CHAIRMAN ROISMAN: Yeah. I had, in the first  
16 slide that GMP presented, the disincentives, the  
17 problems that get in the way, one item that's not on  
18 there is the cost of electricity. And, when you look  
19 sort of at just advertising in general for EVs, there  
20 doesn't seem to be much focus, although I can see good  
21 reason why there should be, on the difference between  
22 how much it costs per mile traveled to drive an  
23 electric vehicle versus a gas vehicle, and I'm just  
24 wondering whether this whole question of how much  
25 you're going to charge for the electricity is a

1 critical factor in moving us from where we are now to  
2 where we want to be.

3 Obviously, at some point, it will become  
4 important. It ought to be fair. There oughtn't to be  
5 any gouging, et cetera, et cetera. Is there any data?  
6 I notice Plug In America mentioned that Con Ed, as one  
7 of its programs, has put in a flat-rate, one-year price  
8 guarantee, and I'm wondering, Is there any evidence out  
9 there that, when you do something with the cost of  
10 electricity for the electric vehicle, you're changing  
11 consumer behavior in terms of buying the cars?

12 MR. OTLEY: Yeah. I would -- Dave, if you  
13 can weigh in on this, it would be great. But, you  
14 know, our experience is most people are focused  
15 initially on the sticker price when they're making that  
16 initial buying decision. Today, you know, I think  
17 conservative estimates, anybody who buys an EV, you're  
18 moving from whatever the current prices at the pump are  
19 to an equivalent of a buck 50 or a buck 25 a gallon  
20 when you go electric, right? So you get an instant  
21 savings right there, but I don't think that that weighs  
22 heavily into buying decisions at the dealership, except  
23 for the most, you know, sophisticated total cost of  
24 ownership economic buyers out there, and there are some  
25 of those; there's just not lots of those.

1           So I agree with you fully. I think that should  
2 be, you know, a really heavily weighted consideration  
3 for the long-term ownership costs for these things  
4 compared to combustion cars, but what we're seeing  
5 today is it's not as heavily factored into the buying  
6 decision as I think we would like it to be. Have you  
7 seen anything different, Dave?

8           MR. ROBERTS: I would generally agree with  
9 that, and I think part of the issue of making this  
10 comparison with gasoline vehicles is, you know, the  
11 different rate structures that are out there. So it  
12 might be a buck 50 on average in Vermont, but some of  
13 these programs that are rolling out could be  
14 significantly less than that. Even with those  
15 potential savings, we still see price, up-front price  
16 as sort of the main barrier. I think some of that  
17 conversation might be shifting, and, if gasoline prices  
18 ever shot up again the way they did several years ago,  
19 I think then it becomes a much more dynamic environment  
20 for advocating for EV choices. If you want to add --

21           MR. O'CONNOR: Just as an EV buyer, I have  
22 two examples. I have a Tesla, and the Tesla dealership  
23 has a tool on the wall where they are trying to promote  
24 this concept of gas savings, and you put in the price  
25 for electricity and the price for gasoline, and you can

1 fiddle with the numbers and see how much you'll save.  
2 Because even there there's a lot of marginal buyers who  
3 aren't sure if it's out of their range, and showing  
4 them a thousand-dollar savings might be enough to get  
5 them to make that leap and take that splurge on a more  
6 expensive car than they've ever owned before.

7         So I've seen that in Tesla dealerships,  
8 advertising the gas savings, and then Nissan does the  
9 "No Charge to Charge", which they advertise also on the  
10 Nissan LEAF and they advertise that at dealerships.  
11 They give you two years of free charging, and, you  
12 know, free appeals to people. I just got an email from  
13 them that I hadn't used it yet. I've had the car for,  
14 you know, several months. I haven't used it on the  
15 LEAF, because I don't charge the LEAF at home. So  
16 they're trying to make sure I take my free charging  
17 while I have it. The car manufacturers are involved to  
18 some degree in promoting the, the gas price savings.

19                 CHAIRMAN ROISMAN: And the reason I'm asking  
20 the question is, as regulators, one of our, one of the  
21 questions is, Where should we be encouraging incentives  
22 to go? So if, if a utility is looking at, well, we  
23 could make an incentive that will cost us, let's say,  
24 \$50,000, by giving a special low rate for an electric  
25 vehicle, provided you do it at the right time of day,

1 versus we could take the same \$50,000 and give an  
2 incentive for you to buy the car in the first place.  
3 Is there some reason to favor one of those versus the  
4 other?

5 MR. MILLER: I think you might have a  
6 different answer, Mr. Chair, if you're looking at a  
7 longer term Level 2 time-of-use rate than if you're  
8 talking about a commercial rate structure, potentially.  
9 So, as you start to think about what are the different  
10 operational costs that could be borne by a site host  
11 for a high-powered, you know, up to 500-kilowatt  
12 charger, you know, are there different costs that come  
13 there that would be passed on, so are there different  
14 types of rates that you want to focus on?

15 But I think, ultimately, the question is a good  
16 one, What's the most meaningful driver of adoption?  
17 And the things that you hear more about are in states  
18 where there are HOV lane access. It's the ancillary  
19 benefit. Do you have charging at work, right, so that  
20 you don't ever have to go to a gas pump?

21 So those pieces are valuable, but then just the  
22 one last piece is price for drivers and for site hosts  
23 really, again, is a signal to incentivize utilization  
24 more so than seen as a cash cow.

25 MR. ALLEN: From at least the Department's

1 perspective, it's, it's, in part, a question of,  
2 Incentive for what? There's an incentive to  
3 potentially move the market, and it's clear that, in  
4 present-day circumstances, that the up-front cost is  
5 what surveys kind of reveal as the, the major barrier,  
6 but, if you kind of look at what is likely to kind of  
7 unfold over time is the differential up-front cost of  
8 electric vehicles is going to diminish over time, and  
9 I've seen projections that suggest that five to six  
10 years from now you kind of reach price parity and that  
11 shouldn't be the issue anymore once you achieve price  
12 parity.

13 What the Department is perhaps at least as  
14 concerned, maybe even more concerned, about is getting  
15 people on a rate that addresses the potential  
16 opportunities and challenges that electric vehicle  
17 loads can present to the grid, and there we kind of  
18 look to rate design as a path to kind of motivate  
19 people to both improve the economic case for purchasing  
20 electric vehicles and for doing it in a way that is not  
21 adversely impacting the grid and potentially may create  
22 new kind of value streams that can be mined by the  
23 utility, by the customer, or third-party agents to, to  
24 the benefit of all.

25 MR. OTLEY: But I think you made a great



1 point, Mr. Chair. I would, I would, in the short-term,  
2 I'd incent buying, and longer term, as things in the  
3 market change, you might want to transition those  
4 incentives more to fuel costs or something like that,  
5 but in the short term our problem -- I have never heard  
6 any electric vehicle owner complain to me about the  
7 high cost of charging. I have heard them talk about  
8 the high cost of the vehicles.

9 MR. TURK: Sure. And I would just say to  
10 Brian's point before that electric vehicles represent  
11 an enormous opportunity for load growth, and so wanting  
12 to make sure that, whatever rates we land on, they  
13 actually supply that benefit. So I completely agree  
14 with Riley's point that the rate design should  
15 incentivize charging behavior so we're managing the  
16 grid load correctly. I think going even further than  
17 that with an additional incentive is not necessary.

18 So making sure that the incentives to charge at  
19 the right times are cost-based, that they reflect the  
20 power supply savings, but they don't go beyond that.  
21 Because, if you cut into the additional benefit, then  
22 all of a sudden, you're not seeing the same load growth  
23 opportunity, whereas you're not making up that revenue  
24 because you've cut into the rate too much. And we saw  
25 that with our unlimited plan where we were doing a

1 cost, a savings share with the participant, so it was  
2 about 70 percent shared, and that was taken from the  
3 power supply benefit of being able to curtail during  
4 peak events.

5 COMMISSIONER CHENEY: Riley, you had your  
6 hand up.

7 MR. ALLEN: I've lost the thought. Sorry.

8 COMMISSIONER CHENEY: Okay. Well, I had a  
9 question, and that is we've been talking -- you raised  
10 the question of cost, and I'm wondering, I'm hearing,  
11 rather, that the dealerships like Tesla and LEAF are  
12 advertising the daily savings associated with owning  
13 and driving an electric vehicle and those savings  
14 aren't just that it's the fuel, as it were, is less  
15 expensive than gasoline or diesel, but also the  
16 maintenance costs are lower, there are other savings  
17 associated with owning an electric car.

18 Are those benefits being advertised enough beyond  
19 dealerships? In other words, are utilities, are other  
20 potential players doing enough of an education campaign  
21 to get people to see electric vehicles as a cost  
22 savings in their lifestyle?

23 MR. O'CONNOR: Well, the Nissan LEAF  
24 dealership still sends me notifications for my oil  
25 change, so -- they were not promoting the -- so Plug In

1 America does try to convey that to people, that there's  
2 a cost savings there.

3 COMMISSIONER CHENEY: But are we doing  
4 enough? Is there more opportunity? Would that move  
5 the ball faster down the road?

6 MR. ROBERTS: Dave Roberts, Drive Electric  
7 Vermont. We do have resources on the Drive Electric  
8 Vermont website that talk about cost of ownership. It  
9 is more focused on the fuel savings than the  
10 maintenance costs at this point, because the  
11 maintenance costs are a little bit more dependent on  
12 the model vehicle. If it's a plug-in hybrid, you might  
13 still have to deal with oil changes, whereas with all  
14 electrics you wouldn't. So we are trying to think  
15 about ways to get that information out.

16 I could say, you know, generally speaking, auto  
17 makers spend I don't know how many billions of dollars  
18 a year marketing their vehicles, and the EVs typically  
19 have been a very minimal element of that, and,  
20 certainly, in Vermont, you know, we see our  
21 representative share, you know, that there hasn't been  
22 a ton of marketing. We have funding through Drive  
23 Electric Vermont to do some of that outreach, and we do  
24 have resources that talk about this issue, but there's  
25 certainly more that could be done.

1           MR. COTTER: Do you see a tension between --  
2 this just popped in my mind. You know, you go and you  
3 buy a new car, and one of the things that the  
4 dealership tries to sell you is the lifetime of the car  
5 relationship with the dealership doing all that  
6 expensive regular maintenance. Do you think that's a  
7 disincentive for dealerships to be promoting the sale  
8 of electric vehicles?

9           MR. ROBERTS: It certainly can be, and that's  
10 one reason why Tesla has advocated for not having the  
11 traditional franchise dealership model, because they  
12 feel like they can represent their product better. I  
13 don't want to speak for Tesla, but that's sort of what  
14 you see out in the world, and that's not universal  
15 across every dealer. So some dealers might take that  
16 perspective, but other dealers may see an opportunity.

17           MR. COTTER: Okay, thanks.

18           COMMISSIONER CHENEY: You had your hand up.

19           MR. SHOAFF: Yeah. Nathaniel Shoaff, Sierra  
20 Club. Our view on the public education component is  
21 that it is a critical driver of EV ownership, and  
22 Sierra Club has a very specific viewpoint. I think  
23 that utilities, particularly in Vermont, are in a great  
24 position where they're going to be trusted by the  
25 consumers in a way that other entities may not be and

1 that consumer education from a utility perspective  
2 ought to be encouraged by the Commission and ought to  
3 be something that we take steps to promote as strongly  
4 as possible here in Vermont.

5 COMMISSIONER CHENEY: Thank you. I'm also  
6 thinking of the Efficiency Vermont ads that you see  
7 sometimes to button up or DIY programs. Could, has  
8 Drive Electric done anything with TV ads, for example?

9 MR. ROBERTS: Unfortunately, we have -- we  
10 don't -- even though Drive Electric Vermont is  
11 coordinated by VEIC, it's completely separate from  
12 Efficiency Vermont, so we don't have a funding stream  
13 to support those types of marketing programs. So we do  
14 have YouTube videos. We do have social media, paid  
15 social media advertising marketing campaigns, but, and  
16 we have done some video spots, including one with  
17 Olympic gold medal winner Ross Powers a couple years  
18 ago that talked about EVs working in sort of winter  
19 conditions in Vermont. So we do have some resources  
20 and media assets like that, but we haven't found a way  
21 to really get those in front of a broader public  
22 because of our limited funding.

23 CHAIRMAN ROISMAN: And I can say I was  
24 looking for information, and the best site was Drive  
25 Electric, and I was sorry that there wasn't more on

1 other sites, even a link to Drive Electric to do just  
2 these kinds of comparisons, you know, what's the  
3 maintenance cost difference, et cetera, et cetera. And  
4 I've sort of wanted, although, given our position, it's  
5 a little hard to get into politics, I've wanted the  
6 Governor to race an electric car at Thunder Mountain.

7 COMMISSIONER CHENEY: Thunder Road.

8 CHAIRMAN ROISMAN: Thunder Road, right.

9 MR. OTLEY: That would be unfair. He'd win  
10 easily.

11 COMMISSIONER CHENEY: Andrea?

12 MS. COHEN: There was a roundup at Thunder  
13 Road with some electric vehicles. There was an event  
14 there. I just want to put a plug. We use -- we refer  
15 everybody to the Drive Electric site, because we don't  
16 need to recreate that wheel, and they've got great  
17 resources and information, and, you know, I want to go  
18 on record to say we really appreciate that, and we  
19 build on that. We've done some videos.

20 I think there was a comment that we're a trusted  
21 source, and we are. We have, like, when we send an  
22 email to our membership, we get a 50 percent open rate.  
23 That's unheard of, you know, in marketing. And so,  
24 when they send something out, certain people open their  
25 things. When we send something out, different members

1 will open our communications. So the more we can  
2 collaborate around the education, I think, the better,  
3 and there's certainly more to do.

4 COMMISSIONER CHENEY: Yes.

5 MR. O'CONNOR: We believe that one of the  
6 best educational tools is ride-and-drive events. We do  
7 Drive Electric Earth Day coming up in April, and the  
8 National Drive Electric Week in September, and people  
9 actually see the vehicles, have a chance to drive them.  
10 It's a great education opportunity in partnership with  
11 utilities, you know, for the different events. What  
12 just came to mind, New Hampshire is doing a  
13 north-to-south relay of EVs coming up. It's the same  
14 size as Vermont, just flipped.

15 So that can be a kind of education outreach tool,  
16 to do relays from one charging spot to another, you  
17 know, where another car takes over. But that kind of  
18 an education tool gets people to see them and a chance  
19 to drive them, which is the best education tools,  
20 actual experience.

21 COMMISSIONER CHENEY: Any data on the  
22 response to these try-and-drive events?

23 MR. O'CONNOR: The commercial rates, I guess  
24 we do have that. Plug In America does have that. I  
25 don't run that side of things, but we can get some of

1 the data. Of course --

2 COMMISSIONER CHENEY: And who is sponsoring  
3 the New Hampshire relay?

4 MR. O'CONNOR: That's coming up in a few  
5 months, I think. But I will make sure that I send that  
6 information to Dave.

7 MR. ROBERTS: Drive Electric New Hampshire is  
8 involved, I think.

9 MR. O'CONNOR: Yeah. It's a north-to-south,  
10 I think.

11 CHAIRMAN ROISMAN: It's hard to go  
12 north-south in New Hampshire.

13 MR. O'CONNOR: Yeah, they're starting pretty  
14 far up.

15 COMMISSIONER CHENEY: Any other questions or  
16 comments? So we've moved from rate offerings. That  
17 was the discussion. We've segued a little into  
18 education, which is not on the agenda, but I think it's  
19 very key to adoption of electric vehicles. We were --  
20 yes, Riley?

21 MR. ALLEN: Are we going to transition away  
22 from rate design? Because there's one statement that I  
23 wanted to make about rate design --

24 COMMISSIONER CHENEY: Yes.

25 MR. ALLEN: -- before we -- so, in my mind,



1     there is an important conversation related to, Do we  
2     rely on kind of whole-house or whole-building  
3     time-of-use rates versus kind of a separate electric  
4     vehicle rate? It's the Department's position that our  
5     electric utilities should be looking toward a separate  
6     electric vehicle pricing regime, and as it relates to  
7     --

8             I mean, part of the reason for, in our minds,  
9     focusing on, say, an electric vehicle time-of-use rate  
10    or a buffet-style rate or any number of other rate  
11    options versus a whole-house approach is that the  
12    history has not been very strong for the time-of-use  
13    rate performance, unless you're talking about, I think  
14    it's Arizona, time-of-use rates haven't taken off, and  
15    just, you know, using my data point of one, Why is  
16    that?

17            I think it's because it, it implicates all the  
18    loads in the house. If I'm a consumer, I'm looking at  
19    an electric vehicle. I'm trying to figure out how to  
20    get value from that. I have to understand all the  
21    other loads in my house in order to kind of make the  
22    judgment about whether this is something I want to  
23    gravitate toward.

24            In my own mind, if I have a separate rate that  
25    relates to the electric vehicle that potentially a

1 dealer can help me to understand and help to make what  
2 I think is a compelling case that's reinforced by the  
3 messaging that Burlington Electric has about their 60  
4 cents versus, you know, 50-cent rate, it is, in my  
5 mind, it's very compelling. So I'm, I guess my  
6 essential point is I'm very wary of relying on a  
7 whole-house or whole-building approach to the rate  
8 design issues as it relates to electric vehicles.

9 CHAIRMAN ROISMAN: And is the Department's  
10 view the same with regard to heat pumps, in other  
11 words, any of these new programs to electrify something  
12 that's been fossil-based?

13 MR. ALLEN: It's more nuanced around heat  
14 pumps, and there are lots of reasons. That's a longer  
15 conversation. But, in our minds, because electric  
16 vehicles are, a typical vehicle is used maybe 2 hours a  
17 day, that means it's 22 hours that it's sitting there  
18 with a lot of flexibility that can potentially be used  
19 at the business, at the home, lots of different places.  
20 I don't think the heat pumps have the same level of  
21 kind of flexibility and clear value that is associated  
22 with electric vehicles.

23 So I, I wouldn't go so far as to generalize our  
24 point that anything that looks like electrification of  
25 a fossil fuel should have a separate rate, but we, we

1 have a very clear stance as it relates to electric  
2 vehicles.

3 COMMISSIONER CHENEY: Are there any  
4 reflections on this concept of having separate EV rates  
5 from the whole-house rate?

6 MR. KARLEN: Sure, yes. Just to piggyback on  
7 that, in our mind, you know, there's two different ways  
8 to induce beneficial charging behavior, and I've spoken  
9 to this thus far, is there's the rate approach, and  
10 then there's the more active management approach, and  
11 both have their virtues. But, you know, traditionally,  
12 there's this push-pull between advanced rate design and  
13 the customer's ability to respond to that, and that is  
14 true in the context of the whole home, right, where all  
15 the different loads are aggregated together, but, when  
16 you have one specific load that can be metered  
17 separately, a lot of these customer concerns and, and  
18 ability to respond to pricing goes out the window, but  
19 that's --

20 COMMISSIONER CHENEY: When you say "goes out  
21 the window", is that, you mean it fails or it succeeds?

22 MR. KARLEN: Thanks. Let me clarify. What I  
23 meant with that is traditional arguments that advanced  
24 rate design and customers' response are incompatible  
25 are really not the case. But that's predicated upon

1     there being a certain level of technology and software  
2     that can make internalizing an advanced rate easy for  
3     the customer, right? So, if you have a smart charger  
4     where you can set your preferences, the maximum I want  
5     to pay, I need X-many kilowatt-hours by whenever I  
6     leave from whatever that might be, the technology  
7     basically works as your broker on your behalf against a  
8     certain rate structure, right?

9             Whether this is the most elegant approach is open  
10     for debate, or perhaps maybe an active management,  
11     managed charging could be more effective and with a  
12     more certain response, but what's key to understand  
13     here is, in either case, it requires a certain level of  
14     baseline technology to make it easy for the customer to  
15     do it.

16             MS. COHEN: Just to share that, you know, we  
17     want to see homeowners get into electric vehicles. So  
18     we're certainly interested in anything having to do  
19     with rate design or technology that will get us there.  
20     It's just a matter -- I think a lot this is about  
21     timing and cost and the cost benefit. So we could do  
22     anything, but, you know, how much is it going to cost?  
23     And, you know, we're seeing technology evolving, and so  
24     I think timing is very important. That's our goal. We  
25     all want to get there. Just how fast and how much are

1 we willing to spend?

2 You know, if we were going to go out and do this  
3 tomorrow, back of the envelope, if it would cost us  
4 \$100,000 to get equipment, and but we're going to  
5 collect only so much back, we have to do that cost  
6 benefit. So I think, you know, in our comments it's  
7 not that we're resistant to the concepts and the goal;  
8 it's just, you know, timing and pace and, you know,  
9 making it make sense and not cost-shifting to other  
10 ratepayers who are not in this game yet.

11 You know, until the vehicles are available that  
12 can meet the needs of our service territory, you know,  
13 all-wheel-drive, trucks, we just have folks that just  
14 can't, and financial constraints, you know, just can't  
15 get into this game yet, and so we don't want to  
16 cost-shift to them, you know?

17 COMMISSIONER CHENEY: Is there a  
18 technological barrier to disaggregating what  
19 electricity is going to the EV and which is going to  
20 the rest of the house?

21 MS. COHEN: Well, right now, for the Level 1,  
22 you know, the plug, we just don't even know who they  
23 are necessarily. If they take advantage of our  
24 incentives, we have a sense, but they don't have to.  
25 So we do have some issues around tracking and then

1 some, of course, you know, the metering, as you've  
2 asked the right questions, you know, What kind of  
3 technology is there, and how accurate is it and how  
4 easy?

5 You know, we can't access right now, you know,  
6 that information unless we're submetering, and that has  
7 a cost. Kind of, you can look at the net metering  
8 model, you know, to install a meter to do a monthly  
9 charge to monitor and bill. So, you know, we're not  
10 there yet. We'd like to get there. So I think pacing  
11 is really important. You know, challenge us to, to get  
12 there and to come up with the plans that make sense for  
13 our service territory.

14 MR. O'CONNOR: We support EV-only time-of-use  
15 with tools to avoid the cost of a second meter, so  
16 submetering or using the capabilities embedded in the  
17 meter or the car or device like they're using in Con  
18 Ed, that's a good approach, and, in some cases, we've  
19 seen that people shift their other loads to off-peak  
20 just because they're in the habit of understanding it  
21 costs the utility to provide power on-peak. I can also  
22 shut some things down even though I'm not getting paid  
23 to do so. So on EV-only time-of-use, they sometimes  
24 will shift other loads to off-peak as well.

25 And, if you're doing a whole-house time-of-use,

1 you can use tools to avoid that, that impact on the  
2 customer like shadow billing. For the first year, they  
3 get both a flat or a regular, constant bill and a  
4 time-of-use bill, and they pay the lower of the two,  
5 and they can see their opportunities to shift loads  
6 around and what they're doing that could impact them.  
7 So that's a good tool you can use in the billing to  
8 prevent time-of-use from hurting people when they first  
9 switch onto it if you're doing a whole-house.

10 MS. LEVINE: I was going to say I think  
11 customer simplicity is helpful. So I think the, the  
12 special EV rate, for reasons that the Department  
13 identified, makes a lot of sense. It lets customers  
14 see what, what's being used by the electric vehicle,  
15 which is a fairly large appliance in their house and  
16 probably different than their other whole-house use.  
17 But I, I'll echo what Green Mountain Power said earlier  
18 about not letting what, what might be complicated get  
19 in the way of going forward. We've, Vermont's figured  
20 this out with net metering, and we shouldn't be  
21 treating electric vehicles differently where we have  
22 different standards across the utilities.

23 MR. LYLE: Thank you. Just a couple  
24 comments. I mean, from Burlington Electric's point of  
25 view, I mean, price signals are important. They're

1 powerful tools. So rate design, I think, is, is a  
2 positive move in the right, we're moving in the right  
3 direction. I would just caution that we, because it's  
4 my job, caution everybody let's learn how to walk  
5 before we run here.

6 And so I, because I can see the next step here as  
7 well. If you're doing it in the residential  
8 households, which is great -- I mean, we're, obviously,  
9 we're doing that right now -- we need to be able to  
10 figure that out, work out the bugs, figure out a way to  
11 automate it. I'm assuming the next step will be to do  
12 the same thing in the commercial sector with commercial  
13 buildings at a university, and that is just a whole  
14 'nother, in my view, a whole 'nother layer or level of  
15 complication.

16 The last thing I, I just, I don't want to -- I  
17 mean, my earlier comments with regard to kind of  
18 scaling things up and trying to figure out the back-end  
19 office systems, I don't want to leave the impression  
20 that we're trying to hold things back. I think the  
21 Commission and the Department know that we're, we're  
22 thinking, we're thinking forward. We've implemented  
23 some programs.

24 We have an IT-forward program that's been ongoing  
25 for a while. I'm not part of that team, thankfully.



1 It's focused on customer information systems, billing  
2 systems, and controlling devices in the field. So  
3 we're working there. We're working towards that, that  
4 goal. It's just taking time. We're, you know, a  
5 municipal utility, which has all sorts of other strings  
6 attached.

7 MR. MILLER: Yeah, just want to echo that,  
8 you know, we're strongly in support of making sure that  
9 we are properly incentivizing the use of EVs. Plugging  
10 an EV into your house is just shy of plugging a house  
11 into your house. It is significant. You know, there  
12 are lots of ways to do it, so we're somewhat agnostic  
13 on that. We support GMP in its EV offerings here.

14 We're working with Xcel Minnesota to do an on-bill  
15 subtractive EV-only TOU rate just using the  
16 smart-charging station without installing an additional  
17 utility meter, because the smarts in the station are as  
18 accurate -- that end-use metering device is as accurate  
19 as you need to be to have that take place, as was  
20 pointed out in the GMP presentation.

21 So there's lots of ways to go about it, so we're  
22 supportive of those. Again, one thing I'd caution is  
23 just, in terms of preventing either the driver or the  
24 site host from being able to participate in signals  
25 that are sent will lead to a poor driver experience and

1 can frustrate investment in EV charging infrastructure.  
2 So it is important for the utility to send the signal  
3 to be able to call events, but there has to be a  
4 two-way street to support EV adoption and to ensure  
5 that folks continue to deploy stations.

6 MR. TURK: Because I know we're coming up on  
7 time, but to add to Conservation Law Foundation's point  
8 about the importance of customer simplicity, I think  
9 there is also the importance of options and customer  
10 choice. BED's rate does a great job of that. It  
11 allows a customer to choose either the managed charging  
12 where they will call the events and curtail or to  
13 self-optimize with time-of-use. We're thinking very  
14 much in the same direction for the EV tariff that we  
15 hope to file soon.

16 I would just reiterate the point that having price  
17 signals that effectively communicate and send a signal  
18 to incentivize good charging behavior but not going  
19 farther than that, and that's just so that we're not  
20 eating into the benefit of additional load growth that  
21 will help downward rate pressure and instead doing the  
22 opposite.

23 COMMISSIONER CHENEY: Yes, Melissa.

24 MS. BAILEY: I just wanted to weigh in  
25 quickly on the rate design concept. I think VPPSA's

1 definitely interested in engaging the Department and  
2 other utilities on this, but we would caution against  
3 overly prescriptive requirements, for instance, that  
4 utilities immediately implement or offer EV-specific  
5 rates, especially at the relatively low levels of  
6 penetration, and I think we just need, at this stage in  
7 the market, we need to be able to do trial and error  
8 like GMP just did with their prescription model and  
9 figure out what works best and account for the  
10 differences in utility territories.

11 I think there are other alternatives to  
12 EV-dedicated rates that have equal merit, and so I  
13 think we would just caution that alternatives like  
14 direct control and then sharing some of that value  
15 stream back with the customer might be simpler to  
16 implement, less costly, and equally effective. And,  
17 again, we're just looking at not standing in the way of  
18 progress, but arriving at our shared goals at the  
19 lowest feasible cost, and folks have drawn some  
20 parallels with net metering, and I think there are  
21 lessons to be learned from that program and that there  
22 may have been added costs that were incurred that  
23 potentially didn't have to be, and we would not want to  
24 go down the same path with EV deployment.

25 MR. ALLEN: So just a couple comments. I'll

1 adopt Graham's comments by reference. On the issue of  
2 timeframes, I agree that, you know, we have to be  
3 sensitive to each utility circumstance. It is  
4 important -- I'm just kind of building on Brian's  
5 earlier comments -- I think, to have a sense of clear  
6 direction, but the timeframes, we should be, we should  
7 be sensitive to the particular challenges of each  
8 system, but we would like the utilities to be working  
9 together and building from the experiences of each  
10 other as they go along.

11 COMMISSIONER CHENEY: Great. It sounds like  
12 a good ending for the morning. So why don't we break  
13 for an hour? That would take us to, let's say, a  
14 little after 1:00 o'clock, couple minutes after 1:00.  
15 And our next topic will be DC fast charging and demand  
16 charges. We've already been talking about some of  
17 that. So it will be a good segue. So thank you. See  
18 you after lunch.

19 (A recess was taken from 12:02 p.m. to 1:00 p.m.)

20 COMMISSIONER CHENEY: All right. So the  
21 second topic is demand charges and DC fast charging,  
22 and in our information request we more detailed said,  
23 "Demand charges and DC fast-charging stations,  
24 including the effect of demand charges on the  
25 deployment of such stations and how such effects can be

1 mitigated or eliminated without undue impact to  
2 electric ratepayers". Do we have questions up here?

3 MR. COTTER: I just had one question, and it  
4 was for the Department of Public Service, and in your  
5 comments you've made a couple of recommendations about  
6 utilities developing different alternatives to the  
7 current demand charge structure to allow for options  
8 for people that wanted to develop and operate DC  
9 fast-charging stations. I was curious if you've  
10 discussed any more specific ideas with any of the  
11 utilities and, if so, how those discussions are going?  
12 Are they going to lead to any sort of firm ideas and  
13 hopefully proposals down the road?

14 MR. ALLEN: I can't -- so, yes, we have had  
15 conversations with utilities on the broader topic of  
16 demand charges, not just demand charges as they apply  
17 to electric vehicles or fast-charging stations. It was  
18 kind of a good, sound, robust back-and-forth. I feel  
19 like there was kind of a narrowing of positions, and we  
20 have prepared a white paper or a position paper that I  
21 should have kind of submitted to the record for the  
22 record, and I will do that as a follow-up to this  
23 question.

24 But, yeah, in terms of where we're going and  
25 whether there -- I'll let them speak for themselves,

1 but from our standpoint we feel like there are, you  
2 know, good, sensible changes to be made for demand  
3 charges generally that would inure to the benefit of DC  
4 fast-charging stations and the like, and I can talk  
5 about that, but it could get a little kind of in the  
6 weeds, but, you know, in broad terms, it really amounts  
7 to taking what exists, a demand charge that applies  
8 essentially on basis of a customer load over the course  
9 of a month and more narrowly targeting that on some of  
10 the key drivers of the kilowatt-month charge cost or  
11 system costs that are related to capacity on a monthly  
12 basis.

13 So taking the broad and, and focusing it, and  
14 there are a number of ways you can do that. Green  
15 Mountain Power has kind of implemented some in relation  
16 to its Rate 63/65. That's a sensible direction, but  
17 there are lots of, lots of options that are available,  
18 and we didn't want to constrain kind of the field, but  
19 we feel like all utilities should be moving -- it's the  
20 Department's position that all utilities should be  
21 mindful of the, the challenge, particularly as it  
22 relates to DC fast-charging stations, and there should  
23 be some accommodation made and ideally one that covers  
24 the cost, that is, doesn't impose a cost on other  
25 ratepayers.

1           And, if I could just clarify that last clause of  
2 mine, there's a difference between shifting kind of  
3 margins and cross-subsidies. We tend to use the two  
4 terms interchangeably at times, and in my own mind  
5 they're very different concepts, and in my mind there  
6 is a path that allows you to take the margins, that is,  
7 the difference between the retail price and the  
8 forward-looking or the marginal costs of a service and  
9 apply that differently in different circumstances, and  
10 we think that applying it differently in these  
11 circumstances may make sense as well.

12           But that's different from the concept of a  
13 cross-subsidy, which is essentially covering the  
14 incremental costs of service with essentially a burden  
15 on other ratepayers, which we don't support.

16           COMMISSIONER CHENEY: So in your comments you  
17 started by saying, "Demand charges as they exist today  
18 present a potential cost barrier to the addition of  
19 direct-current fast-charging stations", and that  
20 opinion was echoed by Tesla in its comments. So could  
21 you speak to that briefly?

22           MR. ALLEN: Sure. We think the demand  
23 charges as they currently exist in Vermont, in the  
24 report we kind of show what those levels are for each  
25 different of our 17 utility systems. The way that it's

1 applied is, if you have even a fairly small load that  
2 occurs for just an hour or so in the extreme, one hour  
3 over the course of an entire month, you get hit with  
4 the same demand charge cost per kilowatt-month as you  
5 would if you had a relatively flat load that led to the  
6 same amount. The result of that is that the demand  
7 charges for, in the early stages of the development of  
8 or the deployment of DC fast charging can present a  
9 formidable cost that isn't really based on the system  
10 cost. That's, that's one of the concerns we have.

11 If they were well-aligned with the system costs,  
12 we wouldn't have quite the same trouble, but the  
13 challenge is there is not, you know, there's no clear  
14 alignment between the customer cost experience and what  
15 is truly happening on the system.

16 MR. COTTER: So I just wanted to clarify.  
17 You started off it sounded like that it was the  
18 Department's sort of a broader policy perspective to  
19 maybe look at demand charges and how they're calculated  
20 and applied generally, and then you sort of ended with  
21 a comment about the benefits to possibly deploying  
22 fast-charging DC stations.

23 Is, is, has the Department put any kind of  
24 priority on the charging stations, or is it you're  
25 doing it more broadly and you recognize that there



1 should be a benefit to the charging stations?

2 MR. ALLEN: We, we think it's sensible to  
3 move in a fairly focused fashion on DC charging. We  
4 think that that's an issue right now that's  
5 time-sensitive and we should try to make early progress  
6 there. I'd be happy if that early progress were made  
7 both specifically and broadly, but I would say the  
8 priority is let's, let's get ahead a bit on the DC  
9 fast-charging board. In my mind, it can apply to Level  
10 2 charging, public charging, as well, but,  
11 specifically, the DC fast charging is where we see that  
12 as potentially a formidable challenge.

13 MR. COTTER: Thank you.

14 MR. KNAUER: I think it would make sense to  
15 get the utilities' reaction to the Department's  
16 perspective in terms of coming up with new rate designs  
17 that might look at demand charges differently than how  
18 they have been traditionally.

19 MR. TURK: Yes, I can mention that we have a  
20 pilot that just recently launched called the "Flexible  
21 Load Management Pilot", which allows for customers to  
22 identify a particular asset that has flexibility in  
23 shifting load to off-peak times and get compensated  
24 directly for the kilowatt reduction during those  
25 events.

1           So it was initially designed for an ice-storage  
2           facility at the Brattleboro Retreat where they would  
3           charge up a thermal battery, form the freezing ice  
4           during the day when prices were cheap, and then let it  
5           cool the building at night instead of triggering the  
6           demand charge. We've now signed up, I think, eight,  
7           and there's a limit for ten. So this is one example  
8           where we're looking at, How do you come up with new  
9           ways to incentivize and help customers save money by  
10          tapping into resources they already have that they can  
11          leverage for flexible demand management?

12                 MS. OROST: So Katie Orost from Vermont  
13          Electric. We have the pilot time-of-use rates for Tier  
14          III projects with no demand charges for commercial and  
15          residential accounts, so we don't see the demand  
16          charges being any barrier.

17                 COMMISSIONER CHENEY: Any other utilities  
18          want to chime in? Okay, Riley.

19                 MR. ALLEN: Well, I'll just, I guess, well, I  
20          think there is an opportunity to potentially use  
21          time-of-use and other rates. I just, the, my concern  
22          again is that those rates haven't been relied on  
23          historically, but, you know, we're glad that they're  
24          out there, and we're glad that Vermont Electric Co-op  
25          has an option there, and Green Mountain Power also has

1 a threshold option for, that they actually spoke, spoke  
2 to in their comments presented on March 1st that has a  
3 rate option that doesn't require essentially the  
4 imposition of a demand charge up to a load of I believe  
5 it's like 7,600 kilowatt-hours per month. That's  
6 helpful, but that doesn't get us all the way there.

7           COMMISSIONER CHENEY: Looking at the comments  
8 we received, there is kind of a spectrum of opinion.  
9 As I mentioned, Tesla thought that demand charges were  
10 a barrier to DCFC, but DCFC in all the comments were  
11 described as essential to those pit stops on long trips  
12 as opposed to the kind of charger you would put in your  
13 home, obviously, not your home, but somewhere you park  
14 for a long place, like, long time like parking at your  
15 workplace.

16           Is this a serious issue in Vermont potentially,  
17 given possibly the few, the small number of fast  
18 chargers you would need. Given, they'd -- you know,  
19 I'm saying they'd be probably along transportation  
20 corridors for the quick in-and-out.

21           MR. OTLEY: Yeah. I guess our view is the  
22 use case on Level 3 is generally as you described it  
23 where someone's either going long distance, point A to  
24 point B and stopping in the middle or somewhere  
25 midstream to get a charge, or someone has had something

1 happen during the day, and they've found themselves  
2 with a low battery and they need a quick top-off to get  
3 wherever their destination is locally.

4         Either one of those scenarios do not, are not  
5 friendly to someone plugging in and getting a message,  
6 We're in the middle of a curtailed event, so just, you  
7 know, hang out for a couple hours, because we're trying  
8 to avoid demand charges here, something like that. So  
9 that's, trying to figure that out, I think, is the  
10 challenge, because the Level 3s have to be available on  
11 the spot all the time. I think it's a, it's a premium  
12 service.

13         So, from a charging standpoint, I think consumers  
14 should expect to pay a little extra for that  
15 convenience and the speed with which the charging can  
16 occur. So that's the -- but I think, you know, it's  
17 not practical to think those things are curtailable,  
18 because, when somebody needs them, they need them.

19                 CHAIRMAN ROISMAN: And I think it was in Plug  
20 In America's comments. They basically said hold on  
21 this for a while until you've got more use. Is that  
22 feasible from a utility perspective? And, if it is,  
23 when do you stop holding? Is there some point at which  
24 you say, Okay, now we've got enough use; now we've got  
25 to start putting the demand charge?

1                   COMMISSIONER CHENEY: I believe it was that  
2 Southern California Edison's demand charge holiday  
3 while usage is still low. Is that what you're  
4 referring to?

5                   CHAIRMAN ROISMAN: Yes, exactly right, and we  
6 didn't have enough to know, How is that working? Is  
7 it, you know, what, what are the consequences of doing  
8 that?

9                   MR. OTLEY: Yeah. It's just a cost shift  
10 when it happens, and at small scale I think that's  
11 tolerable. I don't know what the magic threshold is to  
12 know when we would start to have to think about  
13 changing that due to volume.

14                  MR. HOWE: And by cost shift you mean it's  
15 just shifting to other ratepayers?

16                  MR. OTLEY: Yes.

17                  MR. ALLEN: So, in our view, I'd agree with  
18 the, the point that has been made a couple times that  
19 don't, you can't really expect customers, the end  
20 users, to kind of shift their mode, but you can  
21 potentially send a price signal that is  
22 cost-compensatory. So you can send a demand charge and  
23 then let the station owner decide, you know, how they  
24 manage it, whether they pass it on to the customer or  
25 whether they install a storage device on premises that

1       somehow allows them to manage through that or whether  
2       they just decide to eat it, it's small enough, and it's  
3       not enough of a factor to really matter. They can  
4       figure that out or -- but our position is that the  
5       price signal should be presented. The current design  
6       for demand charges isn't a very precise way of  
7       presenting that price signal.

8                   MR. LYLE: Thank you. Tom Lyle with  
9       Burlington Electric. I just want to follow up with, on  
10      Riley's comment. I'm glad you used to the term  
11      "compensatory". I mean, we have mentioned this a  
12      number of times in our filings that, with respect to,  
13      to demand charges, kW charges, that any, any rate  
14      regime that does go into place for publicly available  
15      chargers and other chargers behind the meter, behind  
16      the commercial meter, you know, should, should be,  
17      reflect prices, and, if that's a higher energy rate,  
18      that's what it should be.

19                   But those aren't always fully compensatory, I  
20      don't think. It's really a matter of what, you know,  
21      what timeframe we're talking about, how, over what  
22      period of time are you going to be able to and what  
23      throughput in terms of kWh sales are you going to be  
24      able to recoup that demand charge? So, you know,  
25      that's, that's, you know, I think, a question for or a

1 risk, I should say, that, that non-utility owners of  
2 publicly, of stations, charging stations should assume  
3 themselves as opposed to cost-shifting to other  
4 ratepayers.

5 We take a pretty hard position on that, especially  
6 with regard to non-utility publicly available charging  
7 stations, because far more EV drivers drive into  
8 Burlington and charge than actually Burlington  
9 residents who own EV chargers. So, so, basically,  
10 what, even if there is a so-called demand holiday or a  
11 cost shift, it's going to be from BED customers to  
12 people coming into town, some of whom are, you know,  
13 out-of-staters, out of the region.

14 And the last thing I guess I wanted to say is the  
15 term "demand holiday" has been raised a number of times  
16 in different venues, and I would just say that there is  
17 no holiday. What it implies, I think, is that, you  
18 know, something is given for free or as a discount or  
19 something like that. There, there, I mean, it's a cost  
20 shift; that's all there is to it. There's no holiday.  
21 So I'll just leave it at that.

22 CHAIRMAN ROISMAN: Well, another way to look  
23 at this is, on the gas side, you pay 10 percent or more  
24 to gas up when you're on the interstate than you do if  
25 you're off the interstate, different areas who have

1     been off the interstate.  Where I live in Vermont, I  
2     pay 10 percent more per gallon of gas than I would if I  
3     bought from the very same station but it's located in  
4     Hanover, New Hampshire rather than in Weathersfield,  
5     Vermont.  So there's already built in the concept that  
6     people are willing to pay for convenience.

7             You're seeing it from the, and appropriately so,  
8     from the perspective, What is it going to cost me, the  
9     utility, but I think that has to be balanced with how  
10    much will the customer -- where is the customer's give  
11    point?  The convenience of being able to charge your  
12    vehicle in 20 minutes when you're on the highway is a,  
13    is a convenience that people will pay for.  Will they  
14    pay as much as what you were going to have to pay to  
15    buy that kilowatt of electricity on the market?  
16    That's, you know, and I don't know that we've got any  
17    studies of that.

18            COMMISSIONER CHENEY:  So in your comments you  
19    also talked about dynamic demand control capabilities  
20    as important, possibly even requiring owners of EVSE to  
21    include that.  Could you talk about that for a minute?

22            MR. LYLE:  Right, sure.  I think the context  
23    here is other people in our organization have had  
24    conversations with non-utility charging manufacturers,  
25    and, in the context of those conversations, they, they



1 did not want to give up control, because it is a  
2 convenience, and I think, yeah, if you're driving down  
3 the highway and, all of a sudden, you're in a peak  
4 time, you want, you want to charge, or you, or you pay  
5 extra, and so I understand that.

6 And so our view is to say, Okay, you know, we're  
7 more than willing to explore the option of an energy  
8 rate so long as it's tied with some sort of active  
9 demand charge in case of those relatively few hours  
10 where, where power, you know, capacity costs are  
11 extremely high. So that's, that's basically where that  
12 position is coming from. I don't know if I answered  
13 your question fully, but --

14 COMMISSIONER CHENEY: I think, I think you  
15 did, but I'm wondering if it's related also to the  
16 point that some other people have made here today that  
17 utilities all, in Vermont, have different challenges  
18 and different profiles, and the way you describe people  
19 charging in Burlington probably has to do with the fact  
20 that Burlington is an employment destination and the  
21 biggest city in Vermont. Is, is that one of the  
22 reasons you're focusing on this cost-shift potential,  
23 that you may be feeling the pressure more than other  
24 utility territories?

25 MR. LYLE: Well, I'll let the other utilities

1 speak for themselves, but that is a pressure point for  
2 Burlington Electric, because we are seeing -- I don't  
3 have the facts in front of me now, but we are seeing  
4 many more people coming in from out of town who are  
5 charging at our publicly available charging stations.  
6 So, to the extent that, that, you know, that we're  
7 incurring capacity costs that aren't being captured  
8 within the kilowatt-hour rate, we're essentially  
9 absorbing that.

10 COMMISSIONER CHENEY: How do you know they're  
11 not Burlington residents?

12 MR. LYLE: Through the ChargePoint dashboard,  
13 you can look up everybody's -- part of the deal is they  
14 provide a zip code, and we, we do a look-up table to  
15 look at that.

16 MR. MILLER: Thank you, Commissioner. So I  
17 just really appreciate the conversation and the focus  
18 on this issue. I don't think there's a  
19 one-size-fits-all solution, and so I just want to make  
20 sure that nothing that I say approximates that  
21 conclusion. I'd like to start by saying that it's not  
22 really a question of whether costs are recovered or not  
23 when you're talking about demand charges but how you do  
24 it that can really have an impact on the ability for an  
25 owner-operator to, not just install the station, but to

1 turn it on.

2 If you're -- unlike a traditional demand-based  
3 rate customer, site hosts of EV charging stations  
4 really have a limited ability to manage or mitigate the  
5 impact of demand charges without negatively impacting  
6 that driver experience as we've talked to. And, Mr.  
7 Chair, you pointed to at what level that cost becomes a  
8 pain point. So, you know, that has to be one piece  
9 that's looked at, and I agree that it's not the only  
10 point.

11 One thing I'd note that, you know, of the tools  
12 that had been mentioned, the different approaches taken  
13 by the utilities, having, for example, a threshold of a  
14 certain amount of kilowatt-hours consumed before demand  
15 kicks in, depending on where that's set, that can, you  
16 know, change the prospective investment from being one  
17 that's viable to one where you'd have to immediately  
18 start hitting 10 to 20 EV charging sessions per day at  
19 a DC fast charger to get, you know, a cost, to recover  
20 costs of investment, you know, within a decade or if  
21 not more. So that does become a challenge.

22 One item that I'd point to, again, knowing that  
23 there isn't a one-size-fits-all approach is that, you  
24 know, alternative structures are worth reviewing. You  
25 pointed to the Southern California Edison demand charge

1 holiday program. There's a proposal by Pacific Gas &  
2 Electric which would replace demand charges with a  
3 lower rate based on the installed capacity for which a  
4 charging customer is willing to subscribe, and then  
5 there is a significant overage charge which would go  
6 in, and there's a TOU component to it also.

7 So, you know, the extent to which alternatives can  
8 be considered while still making sure that they're  
9 revenue-neutral, I think, can work ultimately for a  
10 site host. It has to be simple and straightforward to  
11 understand. In New York the Public Service Commission  
12 just ordered a declining per-port incentive to offset  
13 demand charges with, with non-ratepayer funds, and that  
14 can be complex to explain to a site host, and, to the  
15 extent that the Commission is willing and the  
16 Department is willing to look at alternative approaches  
17 that are still revenue-neutral, I think we can hit  
18 something that meets the, the utility needs, the system  
19 needs, and also makes it easier for the site host to  
20 engage.

21 MR. ALLEN: Yeah. Just to be clear, it's not  
22 revenue neutrality that I seek. It's having,  
23 installing a rate that's commensurate. These are new  
24 loads. I don't -- you know, it's not an issue of kind  
25 of taking from here and putting it over there. These

1 are -- we're fostering an environment that is going to  
2 create new loads and new opportunities for margins to  
3 the utility. It doesn't have to be somehow viewed as  
4 revenue-neutral, even relative to kind of existing rate  
5 designs.

6 I wanted to push back on a notion that's, that  
7 somebody articulated that, if you reduce or remove the  
8 demand charge, it's a cross-subsidy. In my view, that,  
9 that's a very kind of specific issue. It may or may  
10 not be the case. I think it's just as likely as not  
11 that it is, but we have many rates in our portfolio of  
12 rate design that have demand-related costs and  
13 energy-related costs, and yet all we do is charge an  
14 energy-related or a time-of-use cost component, and --  
15 well, I'll stop there.

16 MR. TURK: I would just add, first, I  
17 apologize for my comments before on our pilot as I  
18 realize they were wildly off topic. Still in lunch  
19 mode. Just to confirm the number Riley gave earlier,  
20 7,600 kilowatt-hours that is the limit below which you  
21 are able to be on Rate 6, which is our general  
22 commercial rate. There's also a demand threshold there  
23 which is 200 kilowatts. If you exceed that, you have  
24 to go to Rate 63/65.

25 With the current fast chargers in existence, that

1 demand threshold isn't as important. Most of them are  
2 50-kilowatt chargers, and, even if you were to put two  
3 units together, it wouldn't be half of that. Tesla, I  
4 imagine it's important to them, because they will  
5 typically install eight chargers together, do it all in  
6 one go, and so they can trigger that issue.

7 I think that it's important, though, because we're  
8 seeing from the charging station providers and the cars  
9 themselves the ability to charge at much higher rates.  
10 Getting that charge time down from 30 minutes to 5 is  
11 realistic, but that would require 400-, 450-kilowatt  
12 charging rates, which I saw recently ChargePoint has a  
13 charger that can do. So I think, as the technology  
14 improves, it will be, the demand threshold, will be  
15 more of a concern. So, although it is not relevant for  
16 the current chargers we have, it will be very soon.

17 COMMISSIONER CHENEY: All right. I think,  
18 yeah.

19 MR. KARLEN: Two comments really quickly, and  
20 I'll be very brief here, but I think it's important to  
21 realize, and I think a lot of us are behind this, that  
22 demand charges send a very important price signal, and,  
23 for that reason, I mean, we're oftentimes a little bit  
24 discouraged in certain discourses when it immediately  
25 goes to, Let's just remove demand charges altogether,

1 because that, that works against the promise of EVs in  
2 terms of their integration into the grid being  
3 beneficial, right? So we want to focus on that.

4 At the same time, this ties back into your  
5 conversation in the previous topic. Providing for  
6 driver fuel cost savings is also an important kind of  
7 public policy goal, right? So, when you have, you  
8 know, fast-charging infrastructure that's already very  
9 expensive to develop and then you're getting hit with  
10 expensive rates on top of that, it can be hard to, you  
11 know, provide a charging service at a rate that is  
12 price-competitive with gasoline. So that's a problem.

13 So we're more encouraged in dialogues in rates  
14 such as the VG rate that ChargePoint mentioned here  
15 where they're trying to find some middle ground where  
16 the price signal is still maintained such that the load  
17 doesn't just go out the window with respect to  
18 management. That's a very important thing to keep in  
19 mind, and it can be technology based with storage. It  
20 can be -- you can do management just with, you know,  
21 software as well.

22 You know, there's, we've heard it a few times, and  
23 there's a good amount of truth to it, that, you know,  
24 fast charging is likely less conducive to, you know,  
25 managed charging or management of charging.

1           That being said, we're also a little discouraged  
2           that that oftentimes kind of just shuts down that  
3           thinking there. I think there is ability for some  
4           level of load management for fast charging. I mean,  
5           you could picture a situation where perhaps you pull up  
6           to a station and you're offered a discount for  
7           extending your charging session ten minutes or you're  
8           notified that it's peak and maybe go, you know, it's  
9           going to cost you "X" amount more.

10           And those values, you know, the more chargers  
11           there are, the more you can aggregate together, the  
12           more beneficial that can be, but I would just encourage  
13           stakeholders to not think that immediately fast  
14           charging means that you can't manage that load to some  
15           degree. There's a variety of tools that can be  
16           employed.

17                   COMMISSIONER CHENEY: Is there a potential  
18           for an app to alert drivers to that situation where  
19           they might be better off waiting a few miles or half an  
20           hour?

21                   MR. KARLEN: Yeah, sure, or imagine a  
22           situation where your app says, Hey, you need to charge  
23           in the next hundred miles. Don't go to this station;  
24           go to that station, right? There's things that can be  
25           done, and I just want people to think creatively in



1 that regard just to make sure that load's integrated  
2 intelligently.

3 MR. LYLE: Yeah. Tom Lyle with Burlington  
4 Electric. I'm feeling the urge to follow up on Riley's  
5 comment about the, the cross-subsidies, and maybe I  
6 wasn't completely on point. I think, I think Riley is  
7 correct. These loads are going to be incremental, but,  
8 when it comes to the demand charge, the power of the  
9 capacity costs, if we don't recover those costs from  
10 the station owner or whether from the station owner,  
11 the non-utility station owner, those costs need to be  
12 recovered from someone. So that's really what I was, I  
13 was referring to. The energy cost, yes, is going to be  
14 incremental, especially when it, during certain times  
15 of the day. So I think that just --

16 COMMISSIONER CHENEY: Okay, Graham.

17 MR. TURK: And it makes sense for my  
18 questions.

19 MR. ALLEN: Okay. I don't, yeah, I don't  
20 know that you all want to get kind of immersed in the  
21 kind of the back --

22 COMMISSIONER CHENEY: Not really.

23 MR. ALLEN: So I'll stand down.

24 MR. LYLE: We can take this offline, I  
25 suppose, too.

1           MR. OTLEY: This is entertaining. Let it  
2 flourish.

3           COMMISSIONER CHENEY: Unless you think it  
4 will take us to a new level.

5           MR. ALLEN: I'm not sure it will.

6           COMMISSIONER CHENEY: Okay, yes.

7           MR. TURK: I had a question for ChargePoint  
8 and Greenlots. Have you seen any correlation between  
9 the price of charging at a DC fast charger and the  
10 station use? And the reason I ask is, you know, in  
11 Vermont our, among our charging network, it's 35 cents  
12 per minute, which is rather high compared to some other  
13 states in the US. Is that seen as a driver of use, or  
14 is it just because they're needed when people are on  
15 road trips and there are few other options? Is it more  
16 of a function of population?

17           MR. MILLER: So the question is just about DC  
18 fast charging specifically?

19           MR. TURK: Yes.

20           MR. MILLER: Yeah, so it's much more  
21 inelastic there. You are able to incentivize driving  
22 behavior in longer term charging much more easily than  
23 you can in faster charging scenarios where, as you  
24 pointed out, there is little room for error necessarily  
25 in a driver's driving behavior, right? They need it

1 now.

2 And it's not that you can't do it. Sure, you  
3 could dial down the 500 kW that's going to be installed  
4 in however long down to 7 like a Level 2, but that's  
5 not providing that same service, and there can and  
6 should be a difference in price for the different type  
7 of service that's being provided, but it's really a  
8 question of, What do we need to do now in the interim  
9 period during a low period of EV adoption to a period  
10 of high adoption, and how do we think about what you  
11 need to do to get to a point where you're going beyond  
12 one to five charging sessions a day? So it, it is a  
13 bit more challenging to incentivize behavior through  
14 price that way.

15 MR. KARLEN: Yeah, and I think it's also  
16 influenced largely by the fact that there aren't a ton  
17 of choices with respect to fast charging. It's usually  
18 just one player in town or whatever region you are, so  
19 they kind of largely have a monopoly of that situation  
20 and that charger. That's a whole other can of worms we  
21 should not get into right now. But, yeah, they're  
22 captive to the price being offered in most situations.

23 MR. TURK: And I would imagine it's unique in  
24 that you'd actually navigate to go to one of those  
25 chargers when you're planning a trip rather than, if

1     you're in a conventional car, you see a gas station,  
2     and you drive there.

3             MR. MILLER: Right. I mean, we're doing our  
4     best to make it as seamless as possible, right? So we  
5     provide realtime utilization data: Is the station  
6     free? Is it not? It's integrated into a map software  
7     that you can have on your phone or in your car, and it  
8     does become part of routing and trip navigation. So it  
9     is a bit of a different approach. I think, even when  
10    there are EV chargers in front of people, they don't  
11    necessarily know that they've seen them, because it is  
12    a different cue, right, to the consumer, so we're  
13    trying to engage them on all different fronts.

14            COMMISSIONER HOFMANN: When I look at my app,  
15    it tells me location, whether it's utilized. Does it  
16    tell me the price?

17            MR. MILLER: Yes, it does, and we have a wait  
18    list functionality. So, if it's free and you're close  
19    to it, you can reserve it for as long as the site host  
20    lets you, or, if it's in use, you can put yourself in  
21    queue, and you get notified when it's available. So  
22    there's a lot of that higher level functionality to  
23    make that feasible, and, you know, I think part of what  
24    helps is to provide site hosts with those tools and  
25    with that flexibility to do so.

1           That PG&E rate does provide that flexibility. It  
2 doesn't have to look like that, obviously. There are  
3 lots of ways to get to it and to manage that, and we  
4 really appreciate GMP's rate and thoughtfulness there.

5           COMMISSIONER CHENEY: All right. I think  
6 we're ready to turn to the grid. We've been touching  
7 on it, but now we're going to focus on it, and this  
8 half hour will relate to two questions we put out, one  
9 having to do with the incorporation of growing EV  
10 charging load into the grid and issues associated with  
11 serving that load, and the other part of that is the  
12 potential benefits of managed EV charging to the  
13 electric grid, to the grid, including using EV  
14 batteries for purposes such as peak shaving and  
15 regulation.

16           I think we've already touched on that part earlier  
17 in the morning, but, if there's anything more to say  
18 about that, that would be welcomed. And the likelihood  
19 of realizing such benefits based on EV usage in Vermont  
20 and existing and expected technological capabilities.  
21 Want to start?

22           MR. COTTER: I'll jump in. Sierra Club,  
23 you've been sitting over there patiently all day. In  
24 your comments you've discussed the flexible nature of  
25 EV charging, which I think we all understand or at

1 least under certain scenarios is pretty flexible, and  
2 managing the charging to take advantage of periods of  
3 lower demand. You also discuss shaping the charging  
4 load to coincide with renewable generation. How should  
5 we think about that?

6 I mean, my understanding is that renewable  
7 generation in Vermont, anyway, tends to be solar, and  
8 solar happens in the afternoon when it's not  
9 necessarily the lowest time of demand, unless you  
10 start, I mean, obviously, looking at net demand and so  
11 forth, but the peak and off-peak programs that we've  
12 seen are encouraging people to charge overnight, and  
13 that may not coincide with times when renewable  
14 generation is most available. So how do we get those  
15 two things to marry up together?

16 MR. SHOAFF: Yeah. So I'm Nathaniel Shoaff  
17 from Sierra Club. Yeah, I think you're exactly right  
18 that one of the big benefits of really ramping up EV  
19 adoption is the opportunity to coincide EV charging  
20 with integration of renewables into the grid. Wind  
21 primarily, that's going to be, that's going to happen  
22 at night. But, as you noted in Vermont, a lot of our  
23 renewable generation is solar at this point.

24 I think the, the opportunity here for Vermont is  
25 probably not going to be something that's meaningful,

1     meaningfully realized until we have a lot more EVs on  
2     the road.  We've got 2,600 EVs and hybrids right now in  
3     Vermont.  That's one half of 1 percent of our cars.  
4     You're probably not going to do much to, say, fill  
5     valleys or shave peaks with, with EVs until that  
6     adoption is a lot higher.

7             MR. COTTER:  What if we -- and I'm just  
8     really curious about this.  So we have -- let's say  
9     we're at a time when we have more EVs on the road and  
10    yet we still have a peak, off-peak system in place that  
11    encourages people to charge at night yet we have not  
12    necessarily deployed more wind generation.  Are we  
13    running a risk of encouraging generation -- excuse me  
14    -- of encouraging charging that is going to be drawing  
15    on nonrenewable generation?

16            MR. SHOAFF:  Well, I think the climate  
17    challenge for all of us is we have to do two things  
18    really fast.  We have to decarbonize the grid and  
19    decarbonize the transportation sector.  So I think the,  
20    as we, in Vermont, drive out gas primarily at this  
21    point, you're looking at a lot more wind and a lot more  
22    solar going forward, and I think one of the, one of the  
23    benefits of the exercise that this investigation is  
24    doing is looking not just at what the market is today,  
25    but at what it can be, and with the right set of

1 policies and incentives in place, what can it be?

2 And so I think we should be, as we're looking at  
3 what EV policies make sense for the state, we should be  
4 doing that with an eye toward, What's our generation  
5 going to look like in the future? So I think, as we,  
6 as we push out natural gas and as that becomes a  
7 smaller and smaller market share of our electricity  
8 generation, the wind opportunity in Vermont is going to  
9 get larger and larger, and so that, coinciding those  
10 two pieces together will be a useful lens for Vermont  
11 to look towards.

12 I think, at this point, with our wind penetration,  
13 it's unlikely that we're going to see something like  
14 what you get in California or Nevada where you've got  
15 curtailment of wind because you just don't have, you've  
16 got wind blowing at night when you don't have the  
17 demand.

18 MR. COTTER: Right, right.

19 CHAIRMAN ROISMAN: What's the role, in your  
20 view, of, of battery storage -- I mean, all these cars  
21 are advancing our thinking about batteries and making  
22 them more efficient, et cetera -- of battery storage to  
23 capture that solar during the day when the EVs aren't  
24 likely to be tapping in and having it available at  
25 night as part of the -- I know, as you know, the



1 utilities are now starting to talk about 5-megawatt  
2 batteries and, in some cases, pairing them up with  
3 large solar projects. What's your thinking on that?

4 MR. SHOAFF: Are you, are you thinking about  
5 EVs storing power and then translating that back into  
6 the grid?

7 CHAIRMAN ROISMAN: No. I'm talking about,  
8 if, if the bulk of the people are going to charge at  
9 home, that chances are they're not going to charge  
10 during the time when the sun is shining. So the  
11 question is, Is there a way to get the power that the  
12 sun is generating to those cars at the time when they  
13 want to do the charging? Short of some miracle of  
14 making the sun shine at night, it seems like battery  
15 storage is the only feasible option, and my question  
16 is, Has Sierra Club looked at that and made any  
17 judgments about the relative costs and benefits of  
18 expanding the battery storage options in the state?

19 MR. SHOAFF: Well, thank you. I agree with  
20 the premise of what you're setting out, Mr. Chairman.  
21 I think Sierra Club's probably not in the best position  
22 to say what the state of the market is for battery  
23 charging and how soon that market is going to be robust  
24 enough to play the sort of role that you're  
25 envisioning.

1           MR. O'CONNOR: I think this answers both of  
2 your questions to a degree. You don't need batteries  
3 to have cross-charging off of solar in, at home. You  
4 could just have workplace charging. You could have  
5 time-of-use, which would adjust. You'd adjust your  
6 time-of-use to account for the changes on the grid,  
7 currently every year or so, and, when you start having  
8 a lot of solar on the grid, you have a low price block  
9 in the middle of the morning.

10           Maybe peak doesn't begin until, you know, 2:00  
11 p.m. So 10:00, 11:00, 12:00 is a low price period in  
12 which you would charge EVs at work or at home for those  
13 who are not at work during the day. So there's  
14 opportunities present in the time-of-use that is not  
15 our standard nighttime is off-peak but, in fact, go  
16 beyond that and adapt to the changing grid. That's  
17 important to do when you have time-of-use.

18           MR. MILLER: I'd agree with that point.  
19 We're seeing some exploration of TOU rates for  
20 workplace and daytime charging, and another place where  
21 that's specifically really valuable where early  
22 adoption of transportation electrification is happening  
23 is for fleet purposes where fleet operators look at the  
24 total cost of ownership and they're not making a  
25 vehicle decision based on an emotional, Do I want to go

1 on a cross-country road trip with this car? So, in  
2 those scenarios where you're likely to see a higher  
3 penetration of EVs with a fleet, those charging  
4 profiles are more aligned with a solar midday peak.

5 MR. ALLEN: I'll just say that storage and EV  
6 loads will appear wherever essentially the rate design  
7 signals are there to kind of send them to respond. I  
8 worry about time-of-use rates a bit, because there,  
9 they tend to be relatively static, and, you know, we  
10 currently have a sense of, well, the peak or the  
11 off-peak periods are nighttime currently. That can  
12 flip along the lines that I think other speakers were  
13 suggesting, that is, we could recognize time-of-use  
14 rates as either a more dynamic price signal that  
15 actually moves where the underlying costs are.

16 That can present some problems in terms of a  
17 customer experience, but I think we have to start  
18 looking more toward dynamic pricing signals as we move  
19 forward. I do think, just to repeat myself from  
20 before, storage and EV loads will follow where the  
21 price signals tell them to send. We should send price  
22 signals that reflect the underlying system costs and  
23 renewable demands.

24 COMMISSIONER CHENEY: I think, as we've seen  
25 with the changing shape of the duck curve, we can

1 expect that the curve will change in the future as  
2 well. And time-of-use rates could be changed, not  
3 necessarily on an hourly basis, but once the curve  
4 changes. It doesn't have to be set in stone.

5 MR. ALLEN: I'm sorry. If the, if some of my  
6 colleagues from the Consumer Affairs Unit were here,  
7 they would probably push back on the notion of just  
8 kind of frequently changing --

9 COMMISSIONER CHENEY: I didn't say  
10 frequently.

11 MR. ALLEN: No, I'm sorry. I'm not trying to  
12 put words -- I'll speak for myself. I'm not, I'm not  
13 suggesting frequently doing it, but I am speaking in  
14 terms of managing expectations with consumers.

15 COMMISSIONER CHENEY: Anyone else?

16 MR. COTTER: I actually have another question  
17 for Nathaniel Shoaff, and this, out of curiosity, you  
18 were talking about the idea of peak and off-peak and  
19 different ratios, and I wanted to make sure I  
20 understood something. When you said a two-to-one  
21 ratio, is that where the peak price is twice the  
22 off-peak price?

23 MR. SHOAFF: Yes.

24 MR. COTTER: And then you talk about a  
25 six-to-one ratio, so I would assume that that's where

1 the peak price is six times the off-peak price. And  
2 then you cited a study that said, when the pricing  
3 moved from a two-to-one ration to a six-to-one ratio,  
4 it raised the off-peak charging behavior by 10 percent,  
5 and I was wondering why such a big change in price  
6 would lead to only a 10 percent change in behavior and  
7 whether the study gave any explanation for that.

8 MR. SHOAFF: I don't think so. I don't think  
9 that the study explicitly suggested why that consumer  
10 behavior changed less than that, sort of one-to-one, so  
11 moving six-to-one didn't correlate into a six-to-one  
12 ratio of consumer behavior.

13 MR. COTTER: Right.

14 MR. SHOAFF: But I'm happy to follow up with  
15 the Commission and look through that a little bit more.

16 MR. COTTER: I mean, the one thing that  
17 jumped to my mind was maybe a two-to-one. The pool of  
18 people that were, you know, potential off-peak type  
19 users, maybe most people had already shifted, and so  
20 all you were doing was capturing the fringe. But I  
21 was, so I was just curious if there was another  
22 explanation; that's all.

23 MR. SHOAFF: Yeah, I think that that's  
24 certainly possible. From our standpoint, I think the  
25 big key with time-of-use rates is to make a very clear

1 signal to the consumer with, with not more than three  
2 use, three rates during the time of day, so on-peak,  
3 shoulder, and off-peak, or I forget what the  
4 terminology that Green Mountain Power uses, but it's  
5 something that corresponds to that concept.

6 MR. COTTER: Okay, thanks.

7 COMMISSIONER CHENEY: And we did see that as  
8 a common recommendation, keep it simple for consumers  
9 as much as anything. Okay. Yes, Riley.

10 MR. ALLEN: I'm sorry. Just on the notion of  
11 keeping it simple for consumers, I, part of me  
12 wholeheartedly kind of embraces that, but part of me  
13 also recognizes that there are potentially  
14 opportunities going forward for new business models to  
15 come forward to help bridge the, the interests of end  
16 users and provide simplicity and that of the system to  
17 send, you know, strong, highly complex market-based  
18 signals. There are middle agents that can help to  
19 manage that complexity, and some of them may actually  
20 be sitting in the room.

21 MR. KARLEN: Riley, I appreciate you  
22 mentioning that, and I kind of commented on this  
23 earlier. I do think it's a little bit of an antiquated  
24 lens to be looking at rate design review through the  
25 lens of, the more complex it gets, the consumer's not

1 going to be able to respond, or they're going to be at  
2 some disadvantage or prejudiced in some extent.

3 The EV, single-load EV that's managed with a smart  
4 charger, the customer doesn't have to do anything.  
5 They set their preferences. It's hands-off. They can  
6 be as complicated rate as you want, and the software in  
7 the charger works on their behalf as their agent  
8 throughout the day in real time. So I'd just  
9 challenge, you know, participating stakeholders to kind  
10 of, you know, think what's possible and not use, you  
11 know, traditional lenses for evaluating rate design for  
12 something that's very, very different.

13 CHAIRMAN ROISMAN: So are you saying that the  
14 consumer could say, I want to charge my car today, but  
15 I don't want to pay more than 10 cents a kilowatt-hour,  
16 and the charger will then only tap in when the price is  
17 10 cent a kilowatt-hour or less?

18 MR. KARLEN: Yeah, that's a perfect example,  
19 or they can even get more nuanced. You can say that  
20 but then also, I need "X" amount of kilowatt-hours by a  
21 certain time. There's all kinds of preferences that a  
22 user can put in and then respond to those rates and  
23 even if they're dynamic rates and they change  
24 day-to-day as well.

25 In our comments we cited the rate that San Diego

1 Gas & Electric has as an illustrative example of that  
2 where it's a very advanced rate. It's a day ahead, an  
3 hourly dynamic rate with a bunch of different  
4 components that go into it, but the end result to the  
5 consumer is pretty simple, because the technology does  
6 that for them.

7 COMMISSIONER CHENEY: And I was interrupting  
8 -- my apologies -- to ask if that was currently  
9 available, and it sounds from what you're saying that  
10 it is.

11 MR. KARLEN: Yes.

12 MR. LYLE: Yeah. Tom Lyle, Burlington  
13 Electric. Just two comments. Just want to follow up  
14 on what I think I'm hearing from Riley and others is,  
15 if I can paraphrase, is that, you know, not only  
16 dynamic, but flexibility is, is an attribute, is  
17 something to be valued, I think, and I think we would,  
18 we would support that ability to be not too  
19 prescriptive about how we go about setting rates and  
20 rate design but allow for much flexibility so that  
21 utilities, that distribution utilities can tailor any  
22 kind of rate design to their particular situation,  
23 their service territory. That was Comment Number 1.

24 And I'm glad you brought up San Diego Gas &  
25 Electric. This was the point I was going to raise



1 before the lunch. So your presentation today with,  
2 this morning was very helpful, very informative. It  
3 was totally different from what you actually filed on  
4 -- at least I think it was totally different from what  
5 you filed on March 1. I think Tom Ashley signed that  
6 letter. But, anyway, in his letter he referenced the  
7 San Diego Gas & Electric program, the "Power Your  
8 Drive" program, which is the day-ahead application, and  
9 it sounds kind of neat and innovative and definitely  
10 want to embrace that conversation or encourage further  
11 conversation about that.

12 But what Mr. Ashley didn't include in his, his  
13 filing or what was not raised this morning was the cost  
14 of developing those applications. I understand that  
15 part of the cost is going to be on the Greenlots and  
16 ChargePoints of the, of the world. You know, they're  
17 collecting their membership fees and paying for those  
18 really neat applications that people can look on their  
19 phones, and that's, that's great. It's innovative.  
20 That's helpful. But what's not mentioned is the cost  
21 on the utility side, and so I was just wondering if  
22 Greenlots could provide any kind of information on what  
23 it cost San Diego Electric to roll out this day-ahead  
24 program.

25 MR. KARLEN: Before I answer that, could you

1 clarify a little bit more where you said there was a  
2 disconnect between our messaging in our comments and  
3 our messaging in this room? Where do you see that?

4 MR. LYLE: Well, in your PowerPoint  
5 presentation you don't mention anything about -- at  
6 least I didn't see it -- this application which is what  
7 I'm asking about right now.

8 MR. KARLEN: Yeah, fair enough. The  
9 presentation --

10 MR. LYLE: Just for the record, it was Page  
11 3.

12 MR. KARLEN: Yeah, I have it right here. I  
13 mean, our presentation focused on managing everything,  
14 and I think the point there is, at some point when get  
15 to the very, very nuanced rates and trying to induce  
16 certain behavior with that, at which point does it just  
17 make more sense to do it through active management,  
18 right? And there are two different tools, both of  
19 which our software platform can support. I do not have  
20 those figures off the top of my head. I'll also note  
21 that ChargePoint's the other program participating in  
22 this. Maybe they do.

23 MR. MILLER: It's another crisp dollar bill.

24 MR. KARLEN: Yeah, exactly. That is a pilot  
25 program, right, and we mentioned this to kind of set

1 the fringe here at what's the cutting, what's the  
2 leading edge stuff? It's not as, not as -- not to  
3 purport or say that's exactly what Vermont should be  
4 doing or Vermont utilities should be doing, but it's as  
5 an illustrative example to show what can be done.

6 MR. TURK: Question on the San Diego program  
7 and past management in general, does that require the  
8 vehicle to be plugged in for the whole day? And then  
9 how might you use the technology to do an application  
10 where it requires multiple users to plug in? Might  
11 that be sending a notification that, if it's workplace  
12 charging, to swap out one or the other? Just a sense  
13 of how that's implemented and what it requires on the  
14 user side.

15 MR. KARLEN: Yeah. So for that program to  
16 work, it required a lot of things, right? It required  
17 prequalified hardware. It required prequalified  
18 software where, you know, the utility made sure it  
19 works with their back-end system and that the data  
20 would play nicely with the hardware and the software.  
21 That screenshot I provided in there is of the app that  
22 they developed for their customers at, sorry, their  
23 employees at their various facilities, and it kind of  
24 shows how that can be done. I'm not sure I'm directly  
25 answering your question, though.

1           MR. TURK: Yeah. More just, you know, what,  
2 if, if it's an unrealistic expectation that someone  
3 will keep their car plugged into the charger the whole  
4 day so that the charger can do the management on its  
5 own and how, you know, in a less pilot environment,  
6 something like that could be replicated but using, you  
7 know, more natural behavior.

8           MR. KARLEN: Yeah, I mean, I think it depends  
9 on the use case entirely, I mean, and also it depends  
10 on where the site is, and I will say that's one of the  
11 reasons why site hosts having control over some degree  
12 of how they want to do that is very important, right?  
13 Some places there will be a premium for chargers and  
14 parking spots. Someplace there's going to need to be a  
15 price signal on top of the electricity itself or just  
16 move your car back, right? So those are different  
17 considerations, and it depends on the application of  
18 the site.

19           MR. O'CONNOR: I think it optimizes for that  
20 charging session, not necessarily 24 hours, but you  
21 plug it in and say, I need the car this much charged by  
22 5:00 o'clock, and it optimizes for that session, not  
23 necessarily 24 hours.

24           MR. KARLEN: That's right, yeah.

25           COMMISSIONER CHENEY: I think this is a good

1 transition to our next topic, which is the accuracy of  
2 metering and submetering.

3 MR. LYLE: So, before we move on, sorry to  
4 interrupt, but I, I just want to get back to the point  
5 about the San Diego Gas & Electric case.

6 COMMISSIONER CHENEY: Sure.

7 MR. LYLE: So I think, in terms -- you know,  
8 I asked the, specifically about the, about the costs,  
9 and the conversation kind of went sideways a little bit  
10 from my view. So, I mean, I would just direct the  
11 Commission and the Department's attention to the  
12 California PUC docket where San Diego -- and I'm  
13 looking up -- the number is U 902-E. San Diego Gas &  
14 Electric filed an update February 12th 2019. Under  
15 this "Power Your Own Drive" program, they're required  
16 to file regular reports with the Commission basically,  
17 you know, indicating, you know, how much progress  
18 they're making relative to their plans, and there's,  
19 it's an interesting read.

20 And I was glad to hear that, that Greenlots wasn't  
21 suggesting that the San Diego Gas & Electric Power Your  
22 Drive-like program would be applicable to Vermont, and  
23 I think, once you read this report and the costs  
24 associated with it, I think you, you may have some  
25 second -- you may have reason to, to pause in terms of,

1 of rolling out this kind of a program.

2 So there, my point is, you know, that the cost per  
3 energized port is, is, you know, head and shoulders  
4 above what we're seeing for costs, you know, in the  
5 neighborhood of \$40,000, which is extraordinary in my  
6 view. I'm not exactly sure what all is behind those  
7 costs. There may be some, a lot of up-front  
8 investments that they've, they've made that they expect  
9 to return, recoup over time.

10 But I'm just thinking that technology is great,  
11 it's awesome. We all know that. We just really need  
12 to kind of focus in on the cost benefits and whether or  
13 not the scale of, of a San Diego Gas & Electric  
14 application is really appropriate for Vermont.

15 COMMISSIONER CHENEY: Well, speaking of  
16 scale, just looking at the numbers in the Greenlots  
17 comments, they're talking about 3,500 utility owned and  
18 operated charging stations, which certainly is a scale  
19 vastly different from anything that will ever be seen  
20 in Vermont.

21 MR. LYLE: Right. And, according to the  
22 report I've just referred to, they've built 85.

23 COMMISSIONER CHENEY: All right. Any more on  
24 this subject?

25 MR. LYLE: No. Sorry.

1           COMMISSIONER CHENEY: No, no sorrys. This is  
2 good.

3           MR. OTLEY: Yeah, I'm psyched that San Diego  
4 Gas & Electric is spending all that money to do this,  
5 because, by the time we get to fit it into Vermont, the  
6 cost will be way lower.

7           COMMISSIONER CHENEY: Yeah, right, first  
8 calculators. Okay. So on to accuracy and utility  
9 challenges in regard to accuracy of metering and  
10 submetering. Want to start up here?

11           MR. COTTER: Sure, I'll start. And I don't  
12 know. Maybe my perspective might have changed a little  
13 bit, at least with respect to GMP's presentation this  
14 morning, but I was hoping that we would have an open  
15 and kind of freewheeling discussion between -- I mean,  
16 so we've got utilities here; we've got folks that are  
17 EVSE hardware, software; we've got the Department who's  
18 our planning arm for this sort of thing; and we've got  
19 some folks that are environmental and consumer  
20 advocates.

21           And, certainly, earlier in this process we had  
22 heard a lot about challenges with the accuracy of the  
23 meters that are embedded, for example, in Level 2  
24 chargers that get used at home as well as the meters  
25 that are embedded in the, with, I think it was, the

1 public charging station sort of the gas pump model and,  
2 and challenges that, that the accuracy of those meters  
3 posed for utilities in terms of billing and perhaps the  
4 need to submeter and the costs associated with that and  
5 who pays those.

6 And this morning, though, I heard GMP, at least  
7 for their pilot program, was comfortable with the  
8 accuracy of the metering in the Level 2 chargers that  
9 they had approved for use in their program. But I'm  
10 just curious. I'd like to hear from, I guess, the  
11 utilities first about your concerns and then perhaps a  
12 response from the ChargePoints and Greenlots folks  
13 about the, you know, whether you think those concerns  
14 are well-founded, and then I would really love the  
15 Department's perspective on all of this.

16 So, I guess, I'll, Mr. Lyle, you were just  
17 speaking, so you're all warmed up. Why don't you give  
18 us your perspective on things?

19 MR. LYLE: Sure. Thank you, Mr. Cotter. I  
20 sometimes wonder whether I should write as much as I  
21 actually do. Get myself in trouble. So I think, well,  
22 first point, GMP did make a point of making a  
23 distinction between the residential Level 2 ChargePoint  
24 charger versus a publicly available Level 2, and there  
25 is a difference, and I think I pretty much spelled that



1 out in our last filing.

2 We're comfortable with the accuracy of the Level 2  
3 charger in a residential home. It's a little bit of a,  
4 you know, box you hang on the wall and stuff like that.  
5 There are differences when you start to pivot towards  
6 the publicly available chargers in that every one's a  
7 little bit different. It's a bigger box. You've got  
8 the communication devices in it. It's got LEDs, card  
9 reader, credit card reader. Those use up electricity.

10 What I pointed out in our filing was that we have  
11 an AMI-capable utility-grade meter on one end, and they  
12 have their meter, the ChargePoint meter that we're  
13 talking about here, sitting, if you will, maybe not,  
14 figuratively, maybe not actually, on the port side. So  
15 it's measuring, my understanding, measuring the  
16 kilowatt-hours that are being dispensed in the, in the  
17 battery. It's not picking up what happens in between,  
18 the station use, the electricity.

19 So, you know, why is, why is that important?  
20 Well, first of all, so what we're seeing is a  
21 difference over time at ours, our Level 2s, is there's  
22 about a 2 to 8 percent difference between the, the  
23 utility-grade meter and what ChargePoint is reading out  
24 to us, reporting to us as to what they dispensed.

25 And so we raise that only for, for to make the

1 point that, at some point during this conversation  
2 during this proceeding, I, at least, I believe I heard  
3 that some of the charging station owners were saying,  
4 Don't put in a utility-grade meter. Don't worry about  
5 it. We'll send you the information, and you can bill  
6 us on that data.

7 You know, positions might have changed a little  
8 bit between then and now, but all we're saying is, for  
9 cost-of-service point of view or for revenues, there's  
10 a bit of a, a bit of a loss there. And so right now  
11 it's maybe not that big a deal for those publicly  
12 available chargers, but over time, as more and more are  
13 put in, it could be, there could be a, a growing  
14 concern.

15 So that's the Level 2, 7-kW systems, and then  
16 there are the DC fast chargers. There are additional  
17 losses that are also, that are related from the  
18 AC-to-DC conversion within the system, so those are a  
19 bit higher, and so the more DC fast chargers that we  
20 put out there, there will be bigger differences from a  
21 cost-of-service revenue requirement point of view.

22 MR. COTTER: So, if I understand this then,  
23 as, I mean, what you're concerned about as a utility is  
24 how much energy you're delivering to the station  
25 operator, right?

1 MR. LYLE: Right.

2 MR. COTTER: And that would include the  
3 amount of energy that they dispense to a car that plugs  
4 in, plus the energy that's getting used by the pump, if  
5 you will?

6 MR. LYLE: Yeah, station use.

7 MR. COTTER: Right, right. So, as long as  
8 you have the ability, whether it's through your own  
9 utility-grade meter or otherwise, to measure that total  
10 gross amount of energy that goes in so you can bill for  
11 that, then you're okay, right? And then the station  
12 operator sets its price to the end user that presumably  
13 might include some of that station use, because they're  
14 paying you for that. So, as long as there's some way  
15 to accurately do that, then the utility's being made  
16 whole, correct?

17 MR. LYLE: Correct. And that's why our  
18 position is every station that's out there gets a  
19 utility-grade meter.

20 MR. COTTER: Right.

21 MR. LYLE: So now the non-utility station  
22 owners can do a one-for-one match, one utility meter  
23 per station, or they can do what I call a pod of  
24 stations, one utility meter and three or four stations  
25 behind that meter. Doesn't matter to us.

1           MR. COTTER: So that would be similar to, for  
2 example, if the convenience store next door, not that  
3 this would make sense for them as a business model,  
4 but, if they had their utility-grade meter and they had  
5 their service coming in and it goes to their breaker  
6 box and then they put in a charging station and the  
7 charging station ran off the breaker box, that wouldn't  
8 bother you, right, because your utility-grade meter is  
9 capturing everything that goes into the breaker box?

10           MR. LYLE: That's true. We're fine with  
11 that. I mean, the, the host, the site host, you know,  
12 whether it's Cumberland Farms or whatever, they, you  
13 know, they would pay whatever tariff rate they're  
14 under. Whether it had a demand charge on it or not,  
15 that's what they would get. But what we wouldn't be  
16 able to do -- this is where we kind of get back to the  
17 conversation we were having earlier this afternoon --  
18 is, without some sort of intelligence on the charger  
19 itself, we wouldn't be able to figure out what that  
20 charger is dispensing versus the refrigeration.

21           MR. COTTER: Right, right. Understood,  
22 understood. Any of the other utilities in the back row  
23 there?

24           MS. COHEN: I'd just put a plug in for the  
25 consumer transparency and accuracy, and I know you

1 settled the question of jurisdiction of these, but we,  
2 you know, not only want to make sure we get back what  
3 we're selling so we'd be made whole in that situation,  
4 but our members, we'd want to make sure, are paying,  
5 you know, the appropriate, not overpaying for the  
6 electricity that they're drawing. So at what point do  
7 we ensure the consumer protection both in terms of the  
8 transparency and the accuracy of the metering, that  
9 they're buying "X" amount and they're actually paying  
10 the appropriate?

11 MR. COTTER: Right. When you say that, are  
12 you referring to a public charging station?

13 MS. COHEN: Right.

14 COMMISSIONER CHENEY: And I just want to make  
15 sure everyone knows that that has not been settled. We  
16 have recommended to the legislature that the  
17 jurisdictional issue be made clear, and we've provided  
18 language to that effect. The legislature has yet to  
19 act on that.

20 MR. COTTER: And I would add that we have not  
21 lost track of the consumer protection end of things.  
22 We have made some additional recommendations on that,  
23 and that's under discussion in the legislature, and  
24 it's certainly not something that we intend to let go  
25 by the wayside.

1 MS. COHEN: So, just in terms of accuracy,  
2 you know, the metering, that's just why I bring it up.

3 MR. COTTER: Yes, absolutely. That's on our  
4 radar.

5 MS. COHEN: Thank you.

6 MR. DUTCHER: Dan Dutcher, Agency of  
7 Transportation. I've been involved in most of the  
8 legislative discussions about consumer fairness  
9 surrounding charging, and, obviously, we don't know  
10 what's going to happen until a bill is enacted, but I  
11 think it's important to the legislators as well, and  
12 the way it's probably going is that the Agency of  
13 Agriculture, Farms and Market will deal with it under  
14 their weights and measures program and the National  
15 Institute of Standards and Technology is working on  
16 weights and measures for charging stations.

17 They don't have that done yet, so there could be a  
18 gap period where the Agency of Agriculture may choose  
19 not to enforce, but, if there's something obviously  
20 fraudulent going on in that gap period, the Attorney  
21 General's office could pick that up. But, eventually,  
22 if it, if this responsibility goes to the Agency of  
23 Agriculture, they're going to have to make sure that  
24 the consumer is getting what's advertised, and that  
25 would require some kind of accuracy in the submetering.

1           COMMISSIONER CHENEY: And that's very much in  
2 line with the comments we heard in a previous workshop  
3 as well and with what's being done around the country  
4 and through NIST and other venues, so thank you for  
5 that update.

6           MR. COTTER: That was really --

7           COMMISSIONER CHENEY: Did no other utilities  
8 want to weigh in on the question that Mr. Cotter had?  
9 You then asked -- you said you wanted to ask the  
10 ChargePoints and the others too.

11          MR. COTTER: Yeah, the various groups.

12          COMMISSIONER CHENEY: Sorry, but finishing up  
13 his questions.

14          MR. HOWE: It's on track, and it may actually  
15 add to a subsequent answer if I could.

16          COMMISSIONER CHENEY: Okay. Go ahead, Micah.

17          MR. HOWE: I was just trying to understand  
18 the two-meter problem and the submetering problem. So,  
19 if the, the vehicle-side meter, the EVSE meter, is  
20 actually measuring only what goes into the car and  
21 there's some utility-grade meter further out that's  
22 measuring total power input, whether it's for the house  
23 or whether it's for the cluster of EVSEs, what, isn't  
24 that actually better?

25          So the submetering problem the way I understand it

1 is for time-of-use rates or special EV rates. That's  
2 where that comes into play, and you wouldn't actually  
3 want whatever power is powering the charging station to  
4 be at that rate, necessarily. So isn't that a more  
5 accurate measure of the power going into the vehicle?  
6 So let's say it's low. Let's say the, the charging  
7 side meter is low because there are some peripherals  
8 that are taking up or consuming power inside the  
9 charging station. Isn't that better? Shouldn't the,  
10 the consumption within the meter be at a different  
11 rate?

12 MR. LYLE: When I was making the comments  
13 earlier, I mean, it was more from the point of view of  
14 the cost-of-service and rate revenue.

15 MR. HOWE: But there's a meter somewhere,  
16 right? There's a utility meter somewhere?

17 MR. LYLE: Yeah. But in the context of the  
18 conversation back then when I think this one first came  
19 up was that some of the charging station owners or  
20 industry was essentially just saying, Don't put a meter  
21 in there; just trust us.

22 MR. HOWE: But somewhere there's a meter,  
23 right?

24 MR. LYLE: Well, if it's in this situation  
25 where Mr. Cotter or the scenario that Mr. Cotter



1       referenced where it's behind the Cumberland Farms  
2       panel, yes, there will be a meter there, but what I was  
3       referring to was, you know, a publicly available  
4       charging station or, you know, on, you know, a  
5       commercial business's lot that was not metered through  
6       or not, I'm sorry, not, not metered, in other words,  
7       with a revenue-grade meter but an essentially, you  
8       know, a ChargePoint meter or some other manufacturer's  
9       meter that they would just, say, read it out and bill  
10      us on, on that data stream.

11                 MR. HOWE: I see. Okay.

12                 MR. MILLER: Yeah. ChargePoint's position  
13      has been consistent. We think there are going to be  
14      some use cases in which it makes sense to rely on the  
15      end-use metering, right, just what comes out of a plug  
16      connected to the car to rely on the accuracy of our  
17      embedded metering capabilities which come through the  
18      combination of our hardware and software to be able to  
19      accurately track and communicate the kilowatt-hours  
20      consumed.

21                 And, as you pointed out, there are specific use  
22      cases where that is currently being tested with an  
23      EV-only residential time-of-use rate. That's going to  
24      make sense, but it's not going to work in every  
25      instance.

1           And we don't make meters, right? At the end of  
2 the day, we make EV charging stations that are  
3 intelligent and networked and have those capabilities.  
4 So, when it comes to some of the barriers that  
5 ChargePoint had pointed to previously as to why you may  
6 not need to install an additional utility meter, that  
7 was in the context of looking at an EV-only residential  
8 time-of-use rate where we've seen the cost associated  
9 with installing an additional residential meter as  
10 being a barrier to enroll in EV-only TOU rates.

11           So, the extent to which technology can help there,  
12 you know, we think that that's an avenue that can be  
13 explored, one of many, but we don't recommend  
14 installing this as a meter for all other purposes that  
15 are unrelated to electric vehicles.

16           MR. ALLEN: I just wanted to ask a question  
17 of Kevin. Is there something -- from our standpoint,  
18 it's, it's important to essentially move the  
19 technology, move your meters to essentially embrace the  
20 notion, I believe, of relying on your charging  
21 equipment for the metering functionality that, that can  
22 come with it, and I'm wondering if there's something  
23 that we can do as part of the regulatory apparatus to  
24 help kind of motivate your manufacturers to essentially  
25 provide essentially a, a revenue-grade meter

1     functionality as part of the charging equipment that  
2     you provide.

3             MR. MILLER: I think the efficiencies that we  
4     look for in the manufacturing process and the accuracy  
5     that we look for in being able to measure that output  
6     are, are seamlessly put together. I think the things  
7     that can be encouraging and helpful are, for example,  
8     voicing support or engaging with entities of which  
9     we're a member like the National Electrical  
10    Manufacturers Association, you know, where we engage  
11    with other stakeholders in the industry to see, How can  
12    we get, you know, Energy Star compliance for all  
13    different types of Level 2 and DC fast-charging  
14    equipment?

15            So, you know, I think having the NIST Handbook 44  
16    guidelines in place and adopted as they've started to  
17    do in California and as could be done in Vermont  
18    through the appropriate regulatory processes, that  
19    helps us get there, and the extent to which we can  
20    continue to get even more accurate technology, we're  
21    always open to discuss, but, in terms of  
22    re-engineering, if that's what I understood you to  
23    mean, that can be a challenge.

24            MR. ALLEN: Yeah. I, just to be clear, I'm  
25    not trying to ask you to re-engineer or anything. I'm

1 just asking a very open-ended signal. If our end goal,  
2 if our end goal here is to help motivate you to  
3 provide, you know, potentially improvements in the  
4 accuracy of the metering functionality of your meters,  
5 what, what would you like to see from us, or what do  
6 you recommend we do, just adopt the NIST standards, or  
7 is there something else that we can do to send a clear  
8 signal to you that you can carry back to your bosses  
9 and say, This is important?

10 MR. MILLER: Well, I think, starting with the  
11 places where it's the, the lowest hanging fruit, like,  
12 is there a barrier in Vermont for EV-only TOU rates?  
13 We've heard some differences of opinion as to whether  
14 EV-only TOU rates are the way to go. So, before we get  
15 ahead of the curve and say, Let's remove that barrier,  
16 if that's not the direction Vermont's going to go, I'm  
17 not sure.

18 What kind of feedback? We'd be happy to engage,  
19 you know, our Director of Standards and serve as a  
20 resource as we partnered in California with their  
21 Department of Weights and Measures to make sure that  
22 everyone's on the same page about, you know, What is  
23 the level accuracy, and what are going to be the ways  
24 of moving forward with testing verification to ensure  
25 that consumers are protected? So happy to take that

1 offline. If there are ways that we can collaborate  
2 better, we're always happy to do so.

3 MR. ALLEN: That's great. Thank you.

4 MR. KARLEN: Related to that, just a couple  
5 issues, separate them out. So there's the issue of,  
6 you know, Level 2 submetering in the context of  
7 residential, what have you, and there's also the issue  
8 of public charging, all kinds of fast charging and  
9 metering that load, right? The NIST Handbook 44  
10 tentative code that we were talking about currently  
11 sets the standard for net metering of fast charging.

12 As far as I know, there's no technology that meets  
13 it yet, the 1 percent requirement. I know it's in the  
14 road map for a lot of manufacturers' fast chargers, but  
15 it's not there yet. It's still a year or so out to get  
16 through the certification process, which has, you know,  
17 come to bear in the course of California's rulemaking  
18 where they want to incorporate that code by reference,  
19 but they're realizing that there's not yet the  
20 technology to do that, and that's one issue.

21 On the submetering of Level 2 load, I think that a  
22 theme through our comments here today has been that,  
23 you know, there's two ways to manage load. You can do  
24 it through rates, or you can do it through managed,  
25 smart, active management, right? And the further down

1 the road of a rate design approach, it prevents,  
2 presents a variety of barriers and a variety of costs  
3 and a variety of integration and complication  
4 challenges that have come to have been voiced in this  
5 room several times here today.

6 So, you know, we're an advocate of options and  
7 looking at both approaches, but we also just want to,  
8 you know, illuminate the fact that, you know, smart and  
9 managed charging, active management, whatever you want  
10 to call it, can skirt around a lot of these issues and  
11 can accomplish in many cases the same goals as rate  
12 design, and sometimes it can be a more effective  
13 solution at getting that same outcome. I just want  
14 that to be clear, and that's our thoughts on that  
15 issue.

16 COMMISSIONER CHENEY: What was the 1 percent  
17 figure that you mentioned just now related to, 1  
18 percent of what?

19 MR. KARLEN: I believe 1 percent is the  
20 standard that NIST set in the standard code for DC fast  
21 charging, a standard to which yet there is no hardware  
22 that can meet that standard.

23 COMMISSIONER CHENEY: 1 percent of?

24 MR. MILLER: Of accuracy.

25 COMMISSIONER CHENEY: Accuracy? Thank you.

1 MR. KARLEN: Yeah, plus or minus.

2 COMMISSIONER CHENEY: So you said something I  
3 don't know whether to take literally or not. You  
4 mentioned Energy Star as in relation to charging  
5 stations.

6 MR. MILLER: Yeah.

7 COMMISSIONER CHENEY: Are there more or less  
8 efficient charging stations such that they actually are  
9 within the Energy Star rating system?

10 MR. MILLER: Yes. There are Level 2 Energy  
11 Star standards set by the EPA, and there is discussion  
12 around, you know, what needs to happen to establish  
13 those in the DC fast-charging set. You know, DC  
14 fast-charging technology is new. It's evolving, and  
15 it's growing very quickly. So I think, with the more  
16 established Level 2, we already have those standards in  
17 place for, you know, more efficient Level 2 charging  
18 stations, and we're getting there on the DC side, and I  
19 think that level of efficiency and that level of  
20 accuracy, you'll see a correlation there, and we will  
21 continue to have our engineering teams work on that to  
22 make sure that they can be as efficient and accurate as  
23 possible.

24 COMMISSIONER CHENEY: And is there a  
25 correlation, indeed, if the less efficient a charging

1 station, potentially the less accurate it is?

2 MR. MILLER: I can't speak to that having  
3 conducted academic research. So, again, that was kind  
4 of a back-of-the-envelope look at, as we look at the  
5 technologies in which there's going to be less loss and  
6 which we've had more experience in developing, you  
7 know, they're both more efficient and more accurate. I  
8 think there are a number of issues that you need to  
9 look at on the DC side to unpack that question.

10 CHAIRMAN ROISMAN: Are you saying that there  
11 is now a standard for a Level 2 home charger that it  
12 can be classified as an Energy Star?

13 MR. MILLER: Yeah. I think ChargePoint was  
14 the first to achieve that status, but now there's,  
15 like, 16 or so other units that are available on the  
16 Energy Star website as well.

17 MR. KARLEN: Yeah, you can go to the website.  
18 They're all easy to find.

19 CHAIRMAN ROISMAN: And does Efficiency  
20 Vermont give a rebate for those?

21 MR. WESTMAN: I was wondering if I was going  
22 to talk all along.

23 COMMISSIONER CHENEY: Well, that's really why  
24 I asked.

25 MR. WESTMAN: This is a, this is an important



1 topic, and, yeah, we absolutely understand that there  
2 are more efficient charging stations than others.  
3 Right now, they're difficult to screen for a number of  
4 reasons, and I don't have the EMV specifications behind  
5 it, but we are aware that there are more efficient  
6 charging stations. We're very interested in pursuing  
7 that. We're very interested in working with utilities  
8 and charging partners in the state as they get deployed  
9 to make sure that they are more efficient.

10 Right now, as I understand it, it's the screening  
11 that does get in the way. And then there's also the  
12 discussion of how much EVC funds should really be  
13 directed at something like electric transportation  
14 charging infrastructure. That is an open question in  
15 another case that we don't have to get into here, but  
16 it's definitely worth exploring in order to ensure the  
17 most efficient charging, and, as I've said in other  
18 cases, we are very interested in making sure that,  
19 whenever electric use takes place in the state, that  
20 it's the most efficient form, whether that's a more  
21 efficient electric vehicle or, in this case, a more  
22 efficient charger. So we're behind that.

23 CHAIRMAN ROISMAN: And the ones that GMP is  
24 providing, are they Energy Star certified?

25 MR. MILLER: There are stations which -- in

1 your residential program, there are.

2 MR. OTLEY: A bunch of them are, yeah. Most  
3 of them are.

4 CHAIRMAN ROISMAN: Phew, nearly got you  
5 there.

6 MR. OTLEY: Yeah.

7 COMMISSIONER CHENEY: You owe him a lunch.

8 MR. ALLEN: I just wanted the opportunity to  
9 kind of round out the last conversation and make sure  
10 that there's clarity on where we kind of stood on  
11 submetering stuff, at least as it relates to an EV  
12 load. We do believe that the submetering path is, is  
13 very promising, submetering relying on the charging  
14 equipment but not necessarily prescribing that as the  
15 only path. It, it, in part, it just seems like it's  
16 fairly accurate. There's kind of a governing element,  
17 if you will, which is the, the meter on the household  
18 that is revenue-grade. So, between the two, we feel  
19 like there is not a whole lot of risk of cross-subsidy  
20 between customers and the like.

21 We do think the technology is likely to improve  
22 over time. We are cautious but, you know, optimistic  
23 that that will continue to materialize. We don't  
24 support a requirement that there be a separate  
25 revenue-grade meter on every household if we're going

1 to separately meter EV loads.

2 MR. COTTER: Let me actually return that back  
3 to you just so that I make sure I understand. I mean,  
4 the idea is, if you have a house and you have a  
5 revenue-grade utility meter on there, then all of the  
6 electricity that's going into the house is going to be  
7 accounted for, the utility is going to be made whole, and  
8 then, if there's a slight variation when you get down  
9 into the submetering part for the EV charging, which is  
10 really at least now what we're talking about is  
11 calculating a credit to apply to the bill.

12 If there's a small variation in there, then that's  
13 acceptable rough justice, because, well, if anything,  
14 if the variation is due to the fact that the Level 2  
15 charger is chewing up a little bit of power, well,  
16 that's the consumer's choice to charge at home using a  
17 Level 2 charger. Is that accurate?

18 MR. ALLEN: I think that's well put.

19 CHAIRMAN ROISMAN: And we have some  
20 free-standing chargers in the state, and we have some  
21 fast chargers. Can somebody who's got those tell us  
22 what's happening with the metering on those? Is this  
23 gap between what the customer gets out of the meter and  
24 what the meter itself is actually using up just not  
25 getting paid for? Is there a separate meter that's

1 picking it up? How is that working in practice here in  
2 Vermont.

3 MR. RUTHERFORD: Matt Rutherford with Stowe  
4 Electric. We have one of ChargePoint's 50 kW fast  
5 chargers and nine utility-owned Level 2 charging  
6 stations. What we've seen is a discrepancy of about 2  
7 percent with Level 2 stations in favor of the, the EV  
8 driver and between 7 and 8 percent with the DC fast  
9 charger.

10 Now, this is actually indicated on the spec sheet  
11 for the pieces of equipment as well, referred to as, I  
12 think, an efficiency rating. So it's something,  
13 especially if we're going to start talking about a bank  
14 of DC fast chargers that are owned by some third-party,  
15 it's a consideration that we need to make sure that  
16 they're subject to a separate utility meter to make  
17 sure that all, everything that's delivered is actually  
18 charged rather than the, the current billing protocol  
19 where a, where ChargePoint sends the signal and charges  
20 the customer directly through their account, so then,  
21 ultimately, there's a loss that isn't going to be  
22 accounted for on the part of the utility.

23 CHAIRMAN ROISMAN: In those charging  
24 stations, whether it's a 2 percent or an 8 percent  
25 difference, who's paying that? Is the utility eating

1 it? Is the customer paying for it also? Is the owner  
2 of the facility? Someone's got to be paying.

3 MR. RUTHERFORD: Right. To put a finer point  
4 on it, the utility's eating it. It's not something  
5 that the individual customer is seeing, and to kind of  
6 echo Tom's point from earlier, all, what we're seeing  
7 at our charging stations are these are visitors to  
8 Stowe, not so much Stowe residents. So it, again,  
9 raises the issue that Stowe Electric customers are  
10 ultimately eating that cost as well.

11 MR. OTLEY: It's akin to line losses, which  
12 means, you know, it just gets rolled into the cost of  
13 service and they get spread, right?

14 CHAIRMAN ROISMAN: Which isn't a problem with  
15 a handful but becomes a problem with a thousand.

16 MR. OTLEY: Yeah, I agree.

17 MR. LYLE: Yeah. That's the point I was  
18 making, and, when I was referencing those losses just  
19 like Stowe, those are utility-owned stations, right?  
20 So we have the, the customer base to spread that out.  
21 I just want to try and make a distinction between now  
22 we're talking about a situation where non-utility  
23 station owners are going to be coming into the service  
24 territory, and, and all we're saying is, Stick a meter  
25 on it.

1           COMMISSIONER CHENEY: Yeah, first here and  
2 then Sandy. Go ahead.

3           MR. POTTER: Yeah, I did. I had two  
4 questions. The first was I just, theoretically, these  
5 losses could be built into the -- yeah, sorry.  
6 Theoretically, you could build these losses into the  
7 tariff that Stowe has developed for your owned and  
8 operated charging stations, correct?

9           MR. RUTHERFORD: Correct.

10          MR. POTTER: But that's not currently the  
11 case?

12          MR. RUTHERFORD: Not currently, no.

13          MR. POTTER: Okay. And then I guess my  
14 second point was I think the same one Tom just made  
15 where, in the case where it's a privately operated  
16 station, that utility-grade meter that's sort of behind  
17 the station is going to pick up those losses?

18          MR. LYLE: Right. That's the position we're  
19 putting forward. And so this would kind of lead into  
20 the next section, too, is, is we would give them  
21 whatever rate is applicable to that particular  
22 application, we would charge them by the kilowatt-hour  
23 and it would be up to them to decide how they collect  
24 their fees, whether it's through, you know, 50 cents a  
25 minute, 50 cents a kilowatt-hour, 5 dollars for parking

1 at whatever tax anybody wishes or doesn't wish,  
2 emphasis on the last part, to impose on EV charging, so  
3 --

4 COMMISSIONER CHENEY: Sandy?

5 MS. LEVINE: I was going to confirm that it  
6 seems it's an awful lot like line losses, which are a  
7 part of utility infrastructure, and, if there is some  
8 calculation as to how this compares to what utilities  
9 have for line losses now, there's no differentiation in  
10 the rates. If you live way the heck out and there's a  
11 lot of line losses on the way out to get to your house,  
12 that's shared by the broader utility customers, and it  
13 doesn't matter if --

14 The differentiation between somebody coming in and  
15 plugging in, that's no different than somebody here  
16 taking their cell phone and plugging it in here.  
17 They're from out of state, but they're plugging,  
18 they're using this electrical system that's here, and  
19 that's what the electrical system is for. It's not  
20 differentiated just to be used by the individual, you  
21 know, customer. So I, and, if somebody is plugging  
22 into it and paying for that, they are also a customer.

23 MR. HOWE: So for Stowe's charging stations  
24 are they behind a utility-grade meter?

25 MR. RUTHERFORD: Yeah.

1           MR. HOWE: Okay. So that's how you know what  
2 the difference is?

3           MR. RUTHERFORD: Right.

4           MR. HOWE: So that could be recaptured at the  
5 charging station itself as well, right, with the rates  
6 you charge to the consumer?

7           MR. RUTHERFORD: Well, since it's charged  
8 through the ChargePoint application, there's no way to  
9 capture it, because the ChargePoint application only  
10 measures what's delivered to the vehicle itself.

11          MR. HOWE: But you know, so you know what the  
12 discrepancy is, so you could adjust your charging  
13 rates, couldn't you?

14          MR. RUTHERFORD: Yes. Yeah, I think that was  
15 the, the point that Mr. Potter made.

16          MR. HOWE: Sorry. I didn't follow that.

17          COMMISSIONER CHENEY: It's always good to  
18 hear it said two different ways. All right. Are we  
19 ready to move on to the next topic, which is a hot one?  
20 And that is fees -- might call them taxes -- for  
21 funding infrastructure, replacing gas taxes,  
22 non-gas-using vehicles.

23          We, there are two approaches that have gotten the  
24 most support, and there is a difference of opinion as  
25 to which would be best, a fee based on vehicle miles



1 traveled and a fee applied to each kilowatt-hour  
2 purchased when charging an electric vehicle. So this  
3 is not a settled issue, and I think this should be a  
4 good discussion. Do you want to start off?

5 MR. COTTER: Yeah. I guess it seemed to me  
6 that the, the sort of, -- word-finding problems here --  
7 the point of contention seemed to be the idea that -- I  
8 know that the state agencies, which would include the  
9 Department of Public Service, Transportation, and ANR,  
10 have been very supportive of the concept of  
11 kilowatt-hour fee in terms of road infrastructure  
12 maintenance, and that's kind of an intuitive approach,  
13 because we're all used to the idea of paying a little  
14 bit of extra money for a gallon of gas, and it's also  
15 intuitive because it corresponds, at least to some  
16 degree, to how much you're using the road.

17 And then on the other side we have folks that say  
18 the vehicle-miles-traveled fee is a more appropriate  
19 way to go, but and they've also said, you know, you  
20 need to take into account things like the weight of the  
21 vehicle and so forth, and they both seem to, to have a  
22 lot of merit.

23 The push-back that we've seen on the kilowatt-hour  
24 side has tended to come from the utilities who have  
25 said, Look, it's just we can't do that accurately.

1 It's, again, getting back to the billing system issue.  
2 And then the push-back we've seen on the vehicle miles  
3 traveled has varied from, depending upon how you do it,  
4 if you, like, use a GPS sensor for it, then you've got  
5 privacy issues, and those are very real issues. If you  
6 do it on an annual basis, then it may be difficult for  
7 somebody to make that payment on an annual basis as  
8 opposed to on a per-fill-up basis, if you will.

9 And I think, lastly, one of the other push-backs  
10 we heard on that was you're not going to capture  
11 out-of-state vehicles who are coming to Vermont to  
12 vacation. And let's admit it. You know, a big part of  
13 our economy is driven by tourism. So that's also a  
14 legitimate concern.

15 So, I guess, maybe the Department really has been  
16 the lead spokesperson on this issue. So, if you would  
17 like to put out why you think it's a good idea and  
18 respond to any obstacles that other participants have  
19 raised as problems with that approach and then we can  
20 move to the other folks to respond to the Department,  
21 that would be great.

22 MR. ALLEN: I'll get started. I do think you  
23 did a pretty good job of just kind of framing the  
24 different sides. I'm not sure how well I can do in  
25 kind of building on what you've already presented, but

1 I, from our standpoint, it is somewhat analogous to the  
2 current frame, which is on the basis of fuel volumes,  
3 and that's a positive because it's intuitively  
4 appealing.

5 We do think that it does matter to reflect some  
6 notion of that we're, the cost-causer should pay, so  
7 the idea that heavier vehicles should, you know, bear a  
8 higher cost, and we think that naturally flows from a  
9 per-kilowatt-hour approach, although I acknowledge that  
10 it can be, somehow kind of fit into a vehicle mile  
11 traveler, traveler approach. There is a fairness issue  
12 also with respect to the out-of-state travelers.  
13 They're creating wear and tear on our roads, and it  
14 seems fair to us that they should also be contributors  
15 to the maintenance of our, our highway system.

16 We acknowledge that there are some, Oh, golly gee,  
17 you know, I can just plug my vehicle into the wall and  
18 avoid the fee; nobody will be the wiser. We think  
19 that's, you know, potentially going to be the case with  
20 Level 1 charging. As we think about this, this is  
21 setting something up for the long term. I'm not really  
22 that -- we think that Level 1 charging is, is not  
23 really where the focus is. The focus is really going  
24 to be on the higher volume of full-on EV vehicles, or  
25 the Level 3 and the Level 2 charging is really what we

1 think is kind of most paramount to start to get right.

2 This is something that we want to set up now, so  
3 we think it can be kind of sensibly phased in, that is,  
4 start with a relatively low, low value but create the  
5 structure that gives, you know, all play, all sides  
6 confidence that, when they buy an electric vehicle,  
7 that, when we provide incentives or do things to  
8 motivate electric vehicles, we're not undercutting,  
9 essentially, our roads and highways and so there is a  
10 plan, there is a framework for essentially making up  
11 for the lost revenues that we're already kind of  
12 experiencing as a result of having more efficient  
13 vehicles on the road, so we're already feeling some of  
14 those pains.

15 COMMISSIONER HOFMANN: Mr. Allen, can you  
16 just go back to the point of, you know, the Level 1,  
17 why am I not going to -- I work during the day. I park  
18 my car in the garage all night, and so I just plug it  
19 in, because I don't care if it's 2 hours or 12 hours.  
20 Why do you think that's not be going to be an issue? I  
21 didn't quite --

22 MR. ALLEN: Well, I guess this is just, this  
23 may be my own sense of what, how this is all going to  
24 play out. I, I think, for a lot of reasons, what's  
25 going to happen is we're going to gradually shift to an

1 all-electric vehicle, EV vehicle system and that there  
2 are going to be hybrid kind of Level 1, people will use  
3 Level 1 charging for hybrid vehicles. I think that, as  
4 the range of vehicles increases, as the size of  
5 vehicles increase, I think there's just going to be a  
6 natural gravity toward Level 2 charging in the home.  
7 So I think, at least in my own view, that's going to  
8 capture most of what we're going after.

9 So I feel like the Level 1 charging, sure, if I  
10 have a hybrid vehicle or if I have a vehicle that gets,  
11 has really, you know, fairly decent efficiency, you  
12 know, I might be able to get away, if I don't use my  
13 vehicle very much, just relying on Level 1 charging in  
14 the household without having to gravitate toward Level  
15 2.

16 It's my own view, anyway, is that that's, that's a  
17 more of a transition issue, and it's not, it's not  
18 where I think the emphasis of kind of making up for the  
19 lost revenue should really be associated with. What I  
20 think, most of the energy is going to be purchased, and  
21 that's going to be on Level 2 and Level 3.

22 MR. COTTER: Does rate design play a role in  
23 that? For example, if you have a rate offering like  
24 GMP's or BED's but it's getting that good rate for your  
25 EV is contingent upon using a Level 2 charger, is that

1 a way to help sort of offset the tendency for people  
2 like Sarah to try and game the system and plug their  
3 car in and sleep for 12 hours every night?

4 MR. ALLEN: So the short answer is "yes".  
5 Thank you.

6 MR. POTTER: Someone beat Riley to the rate  
7 design punch?

8 MR. COTTER: I was just channeling.

9 MR. ALLEN: So, in my view, in order to kind  
10 of effectively set a fee or a tax on using the  
11 per-kilowatt-hour approach, you really have to create  
12 an opportunity for ratepayers to essentially gravitate  
13 toward an electric vehicle rate. So you have to  
14 recognize that, when you have electric vehicles and  
15 electric vehicle loads, they're massively flexible and  
16 can provide many value streams to the utility.

17 In our view, those value streams should be  
18 channeled through the rate design to the ratepayer to  
19 create and motivate customers to, one, adopt that rate,  
20 and, two, buy electric vehicles, and when you've done  
21 that, it, it also seems reasonable to offset that  
22 slightly, and, you know, we talk about how much, but  
23 offset that to a degree with a payment for the, the  
24 road system that we have in the state.

25 But we think that, very much, that the rate design

1 helps motivate the, the acquisition of the Level 2  
2 charger that can lead to controls or that allows the  
3 metrology that is needed to differentially price the  
4 electric vehicle to benefit the system.

5 COMMISSIONER CHENEY: I'm finished with this  
6 line. I just want to throw something in.

7 MR. COTTER: I was just going to ask. This  
8 veers off a little bit, but has the Department  
9 considered an approach where a more of a hybrid  
10 approach where --

11 COMMISSIONER CHENEY: That's exactly --

12 MR. COTTER: -- where, for example, public  
13 charging stations would collect a per-kilowatt-hour fee  
14 and, that way, you would account for out-of-state  
15 drivers who are coming in and using our roads and,  
16 therefore, would contribute to road maintenance, but  
17 then, for the rest of it in maybe an attempt to  
18 alleviate the utility concerns, since most charging  
19 occurs at home, do something else that would account  
20 for the home charging such as an annual registration  
21 fee based on average miles traveled, and then you could  
22 even adjust it downward by some percentage to account  
23 for the fact that, you know, even people that charge at  
24 home most of the time are, on average, going to be  
25 charging at a public station, you know, say, 10 or 15

1 percent of the time and will be paying the  
2 per-kilowatt-hour fee when they do that? Just curious.

3 MR. ALLEN: Well, I mean, there are other  
4 colleagues here that will want to kind of weigh in on  
5 this.

6 MR. COTTER: Sure.

7 MR. ALLEN: You know, we still -- I mean,  
8 it's not just the out-of-state traveler issue, although  
9 I think you do get at the, you know, the fairness  
10 issues associated with out-of-state travelers by  
11 addressing at the public charging station frame. From  
12 our standpoint, there are, there are other equity  
13 issues that continue to kind of, equity and sensibility  
14 issues that continue to suggest that applying it even  
15 on Level 2 charging within the household makes sense to  
16 us, and that relates to the, you know, the vehicle  
17 efficiency and, you know, the equity and the just the  
18 sensibilities of people because of the, the,  
19 essentially, the arrangements that currently exist.

20 But we do acknowledge that you can do it more than  
21 one way. We do think that -- I mean, if you -- you  
22 know, I am concerned about the amount -- I really want  
23 -- you know, I'm really motivated by this notion of  
24 passing a discount or discounted rate on to EV owners  
25 along the lines that Burlington Electric Department



1 has. I think, over time, that will inure both to the  
2 benefit of Burlington Electric System and to those that  
3 essentially move to adopt electric vehicles, and I  
4 think that will essentially accelerate the curve once  
5 the dealers and others sort of start getting the  
6 message around that this could be a very powerful  
7 incentive.

8 So, in my mind, you know, I don't want to,  
9 personally want to necessarily push it all onto a  
10 per-kilowatt-hour basis, but I still think it can  
11 extend beyond and into the home on a customer basis if  
12 we have a separate rate design set up for the customer  
13 to be motivated to charge their vehicle through the  
14 rate.

15 MR. COTTER: And I would acknowledge that  
16 the, the hypothetical that I just threw out, you know,  
17 there, if any time you have a flat fee, you're, you're  
18 going to be, have variances away from, you know, actual  
19 miles driven versus average miles driven, and there  
20 would be winners and losers on that, but I thought it  
21 would be an interesting topic to explore.

22 CHAIRMAN ROISMAN: And I have a question for  
23 the, for the software part of this. The charger, as I  
24 understand it, all the electric vehicles now are  
25 computer-based, that is, they've got computers inside

1 of them. Forget about old non-electric cars. And,  
2 once you've plugged into the charger, that computer  
3 information is accessible. I don't know whether your  
4 current software does it, but you could access it. So  
5 you could, at the time that you charge the car, you  
6 could find out not only how many kilowatts it's going  
7 to charge, you could find out how many miles it's  
8 driven since the last time it was charged, and, in  
9 theory, you could produce a bill that included a  
10 per-mile charge for the transportation infrastructure  
11 as well as a kilowatt-hour charge for the electricity  
12 if people felt that the miles charged, miles traveled  
13 was the better measure. Is that correct? Am I correct  
14 that the software would have that capability?

15 MR. MILLER: So there are established  
16 communications protocols which determine what  
17 information is shared between the vehicle and the  
18 charging station when that connection happens. There  
19 is state-of-charge information that gets sent, and  
20 then, ultimately, the vehicle is determining how much  
21 charge to take. We don't take that kind of diagnostic  
22 information out of the vehicle, and I would defer to my  
23 friends in the OEM industry as to the feasibility of  
24 that, which seems challenging from a, a personal  
25 information standpoint as well as a potential liability

1     standpoint.

2             But there is information.  There are some vehicles  
3     that have telematics where they're getting higher  
4     functional data.  But the type of information that we  
5     collect is limited to the charging behavior, and for,  
6     and that's, for ChargePoint, we always do because our  
7     stations are all networked.  There are many Level 1 and  
8     Level 2 stations that are not networked.  So, if there  
9     is no network, if there are no smarts, there would be  
10    no collection at all.

11            MR. KARLEN:  Correct me if I'm wrong, but I'm  
12    pretty sure the only time there's communication  
13    happening between the charger and the vehicle is in  
14    fast charging, EZ fast.  There isn't communication on  
15    Level 2 at this point; is that right?  That's my  
16    understanding.  I know that's what the industry is  
17    working on right now in the context of V2G and all that  
18    and setting protocols that would allow for  
19    communication.  I know there's a whole bunch out there.

20            But, currently, it's the, the communications  
21    happening between the charger and the vehicle, as I  
22    understand it, is limited to EZ fast, and that's just  
23    in order to ensure that the charge happens safely,  
24    because there's a lot of current going on there.  I  
25    don't know if that answers your question, but --

1           CHAIRMAN ROISMAN: No.

2           MR. KARLEN: But, in theory, everything  
3 you're saying, yes, could happen at some future state.  
4 I mean, I live for the day when just the charger, you  
5 know, you plug into a charger and the customer doesn't  
6 have to do anything. You don't have to bust out a  
7 swab, you don't have a swipe a credit card. Your car  
8 acts as your agent on your behalf, talks to the  
9 charger, brokers a transaction, pays for it, and that's  
10 it, right? That will come at some day, and when we get  
11 to that point in time with the functionality that you  
12 speak of, I would presume that to be, yeah, possible.

13           MR. MILLER: And we'll have a totally  
14 different consumer protection conversation at that  
15 point. What did I just pay for? Right. So there are  
16 all kinds of points in which you still have to engage,  
17 but, yeah, I mean, lots can happen with software that's  
18 out there, but, again, just to stress the limitation  
19 that not every station is networked, and so that has  
20 implications for, not just the question that you're  
21 asking, Mr. Chair, but then also compliance with the  
22 potential kilowatt-hour fee collected in general.

23           COMMISSIONER CHENEY: So but, given that the  
24 vast majority of charging at this point in our time  
25 happens at home and that really falls to the utilities,

1 we're really interested in hearing the challenges for  
2 the utilities at becoming the entity that engages in  
3 this new replacement for the gas tax.

4 MR. OTLEY: So, just before we jump there, I  
5 just want to point out -- I just want to throw a little  
6 wrinkle at Riley's comments, which I love to do. The  
7 non-network Level 2 home charging would, is another way  
8 to bypass. So you can still get the benefits of Level  
9 2 charging at home, and, if you have effectively a dumb  
10 charger, you're not going to be paying the tax. It's  
11 the same as plugging into the wall, except it's a  
12 faster charge. So you get benefits of the faster  
13 charge, but you're bypassing any sort of per-kWh fee,  
14 and that's, and that's -- what I don't want to see is  
15 that market come back.

16 You know, we want these charging sessions to be  
17 visible and controllable, and we don't want to offer a  
18 disincentive to be part of the network solutions,  
19 because all of that intelligence that all these  
20 companies are creating with their hardware and their  
21 software is a benefit to what we're trying to do.

22 COMMISSIONER CHENEY: Oh, I'm sorry. I  
23 didn't see you.

24 MR. ALLEN: Yeah, I just wanted to mix it up  
25 a little bit with Brian. No, at least the, the

1 scenario that we're advancing is to create a, you know,  
2 highly beneficial electric vehicle rate and for that  
3 rate to essentially act as a sleeve for, you know, a  
4 per-kilowatt-hour charge for, for the roads and  
5 highways. I'm not sure why anybody would want to  
6 bypass that. Maybe I'm not understanding.

7 MR. OTLEY: So --

8 MR. ALLEN: Why would I want to avoid a  
9 beneficial rate?

10 MR. OTLEY: I thought you were making the  
11 distinction that people have been plugging, people who  
12 plug into just the 110 socket under the per-kWh fuel  
13 tax concept would bypass that, because there would be  
14 no way to measure it. And then I thought you went on  
15 to say that we really want to see Level 2, Level 3  
16 charging and that cures that. I'm just pointing out  
17 that, for Level 2 home charging, it may not cure that,  
18 because a dumb Level 2 charger at home is not going to  
19 provide measurement against which to apply the fuel  
20 tax, but it will provide the faster charging time.  
21 That's all.

22 MR. ALLEN: Okay. Sorry. I was slow to pick  
23 that up. My bad.

24 COMMISSIONER CHENEY: Equivalent of plugging  
25 in your three-prong plug for a dryer, is that what --

1           MR. OTLEY: Yeah. If you have a 240, I mean,  
2 that's what all the chargers, Level 2s in the home have  
3 that, but you can just plug in a dumb station to that  
4 faster amp, and you get the benefits of the faster  
5 charge; you just don't have the intelligence in the  
6 charger.

7           MR. MILLER: Or a non-networked commercial  
8 station, so it's not limited to residential.

9           MR. KARLEN: It doesn't have to be dumb  
10 either. I mean, you could go on Amazon and get a smart  
11 one that's not through the utility or through some  
12 utility-procured program, right? There would be this  
13 black market of sorts like how you, you know, you can  
14 skirt around your cable box, basically, you know,  
15 right?

16           MR. DUTCHER: Dan Dutcher, VTrans. I think  
17 the idea is that, if we have rate design, it would be  
18 cheaper for the consumer to use the utility's, you  
19 know, networked charger. They're not going to be able  
20 to cheat the tax man. They're going to end up paying  
21 more. And I just also wanted to point out that the  
22 legislature has been fascinated by this issue as they  
23 have for a number of years, and we, we have actually  
24 been trying to hold them back.

25           COMMISSIONER CHENEY: Good.

1           MR. DUTCHER: They have been quite interested  
2 in the idea of a per-kilowatt-hour charge especially  
3 and other things that they can do with what, you know,  
4 Riley is calling a sleeve, and we are encouraging them  
5 to wait for this Commission to issue a report, and the  
6 agencies, it looks like, are going to be ordered to  
7 take the report and process it and report back to the  
8 legislature with recommendations. So everybody's, you  
9 know, very eager about this.

10           And I, I did want to say, maybe almost reiterate.  
11 There does seem to be a very close connection between  
12 the idea of this possible per-kilowatt-hour tax and  
13 rate design for a variety of reasons, and one has to do  
14 with just the setup. It seems -- I realize there's  
15 some controversy about virtually everything, but it  
16 seems like it could benefit everybody if we do have  
17 rate design which is going to require essentially  
18 segregating electric vehicle loads from everything else  
19 that's going on.

20           Whether you're at home or in some commercial  
21 setting, the utilities are going to want to know what's  
22 going on so they can plan and so they can manage loads,  
23 and this is something that can benefit the consumer,  
24 and it also has a lot of policy advantages, because the  
25 agencies can get in there with things like a fee for



1 highway usage or even other things.

2           There's talk of a transportation efficiency  
3 charge, and I'm, I'm obviously very sensitive to  
4 Riley's comments about sort of loading up the charges  
5 on charging, because we, we want to keep things  
6 affordable and keep barriers as low as possible, but I  
7 am just pointing out that there are a lot of benefits  
8 from a lot of different angles to the per-kilowatt-hour  
9 charge, and VTrans has been arguing, so far  
10 successfully, for years against increased registration  
11 fees because of the barrier that that can present.

12           We don't have a lot of data on it, but,  
13 apparently, there is some research starting to come out  
14 that's showing that increasing registration fees can  
15 affect electric vehicle sales. So we, you know,  
16 continue to oppose that, and, you know, I do encourage  
17 you to look at all options here, including vehicle  
18 miles traveled, but the collection issue there seems  
19 like it could really get difficult. Some people won't  
20 pay, and then, you know, what do you do with them? Do  
21 you suspend their licenses and all that?

22           There's very complicated interstate-type  
23 discussions that are going on. So it could become  
24 something like apportioning taxes for big trucks, but,  
25 of course, individual consumers have different privacy

1 concerns compared to truckers. So it seems like there  
2 would be quite a long way to go to get a VMT system in  
3 place.

4 And I, I am also sensitive to putting pressure on  
5 the utilities, but it seems like, if we're going to go  
6 with rate design and we're going to end up having to  
7 segregate electric vehicle loads anyway, then we should  
8 be able to add a per-kilowatt-hour charge. It seems  
9 like the big barrier, the obstacle that we're facing is  
10 the administrative task that this is going to put on  
11 the utilities. I think, and I'm still picking up  
12 utility jargon. I think they call this a back-office  
13 issue, which I understand to be sort of a modern age  
14 cash register problem. They've got to -- they can get  
15 the data with reasonable accuracy from what's going on  
16 in these chargers, but they somehow have to integrate  
17 it into their billing system.

18 So, yeah, you know, that's going to cost them  
19 something to do, but, if there's going to be rate  
20 design, they've got to figure all that out anyway. So  
21 that, that's, you know, the way I'm looking at it. I  
22 realize I'm not the one who has to do all this, but the  
23 point I'm trying to make is it seems like there are a  
24 lot of policy advantages to going with a kilowatt-hour  
25 charge versus some of the alternatives.

1                   COMMISSIONER CHENEY:  So I think that this  
2  now is time definitely to hear from utilities, because  
3  you've characterized it one way.  I'm sure they have  
4  some insight here.  You want to say something first,  
5  Ms. Levine?

6                   MS. LEVINE:  Yeah.  I don't want to be  
7  accused of being in the utility camp, but I think, you  
8  know, there's a big -- Conservation Law Foundation  
9  opposes the per-kilowatt-hour fee and because, in part,  
10 it's part of a bigger issue:  How do you pay for roads?  
11 And for years we've been hearing the gas tax revenues  
12 are declining.  Cars are becoming more efficient.  
13 We're just getting less and less money for roads.

14                   We're not solving that problem by adding another  
15 revenue-producing mechanism that is not linked to the  
16 usage of the roads.  So I think this creates a bigger  
17 opportunity to bite off the bigger problem of how you  
18 pay for roads rather than just create another, another  
19 smaller problem that is also difficult to manage.

20                   And I'm really bad with back-of-the-envelope  
21 calculations.  I always joke that I went to law school  
22 because I can't do math, but, you know, and I think  
23 some of the other comments also raise this.  There's  
24 just not that much lost revenue currently because of  
25 this.  It's more of a perception problem than it is a

1 real problem, and I think we have enough real problems  
2 to be tackling to not be trying to solve perceived  
3 problems.

4 COMMISSIONER CHENEY: Great, thanks. Mr.  
5 Dostis?

6 MR. DOSTIS: So it's a good segue, because,  
7 as the gentleman pointed out, Dan pointed out, the  
8 legislature, obviously, and we know has been kind of  
9 engaged in the conversation. I've been there a couple  
10 of times testifying, Robert Dostis, and it's been a  
11 learning process for me, right? And I, I joke about  
12 this, and people have repeated it, so I probably  
13 shouldn't here, but a couple of weeks ago I did have a  
14 conversation with someone, and they asked me about  
15 being able to do the kilowatt-hour charge. Now, I was  
16 like, yeah, probably shouldn't be too hard, right?  
17 We're doing it now.

18 And now, when I testify and since then, I've  
19 learned quite differently that, in fact, we are,  
20 actually, we know very little. There's a very small  
21 number of homes that have chargers that we actually are  
22 able to get that data from and the way we get that  
23 data, and there's 160 of them, and they're involved in  
24 our pilot project, our unlimited pilot, so we have to  
25 have that data in order to do their billing, and we

1 have to manually go out and get that data. The  
2 customer has Wi-Fi. It's on some sites. We get that  
3 site. We download it internally, input it onto  
4 spreadsheets. It gets checked. It goes through about  
5 eight steps, three different people, and then it gets  
6 updated into our billing system. So that's what we  
7 know now.

8 Now, we have other charging stations out there  
9 that we don't access their data. It's behind the  
10 meter. They're getting billed the normal way. So, if  
11 we were to move in this direction, and maybe, over  
12 time, we will -- and that's, to me, the important  
13 phrase -- this is going to take some time. Because, if  
14 you think your process is going to take time to get us  
15 to the point -- and it will take, you know, updates in  
16 the billing system and, you know, what the cost of that  
17 is, what the technology exists to do that is, I don't  
18 know, and maybe Brian has a better handle on that, but  
19 that will take time for us to get there.

20 So, right now, we are very limited. So it's not  
21 only about the Level 1 or Level 2 chargers who can do  
22 their own thing and not even be part of one of our  
23 programs so we wouldn't even know about that, but those  
24 folks who are in our programs we do know about, getting  
25 that data is very laborious and labor-intensive, and it

1 will take time for us to figure out how to actually do  
2 that, and then we also have to address the fairness  
3 issue across the board. So that's what I've learned  
4 in, like, these two or three weeks' process for me. So  
5 it just says to me it will take time.

6 COMMISSIONER CHENEY: So, just to make sure  
7 we understand, we're talking first about Level 1 and  
8 Level 2 chargers that aren't smart. You're saying that  
9 the smart chargers that GMP is connected to can't give  
10 you the kind of data that is used automatically, that  
11 it has to engage a manual system, even though you have  
12 access to the data?

13 MR. DOSTIS: Exactly. So our billing, our  
14 data, our smart meters, we get that data. It goes  
15 right to our billing system through management, right?  
16 This other information, we actually have to get it  
17 through another mechanism and then manually put it into  
18 our billing system. It's not automatic.

19 COMMISSIONER CHENEY: What do you mean by  
20 "this other information"?

21 MR. DOSTIS: The charging usage on those 160  
22 meters, we have to -- charging stations, I'm sorry,  
23 charging stations -- we have to go and get that from  
24 another source, download it, and then eventually  
25 manually put it into our billing system.

1           MR. OTLEY: And this is consistent with my  
2 earlier comments, which is, at the current scale we're  
3 at, we have not made the changes to our back-end  
4 process to automate that for two reasons. One, it's  
5 not a ton of volume. It's problematic, it's a work  
6 effort, but it's not like it's millions and millions of  
7 records. And, two, we're not confident that the rules  
8 around how we have to manage this data to turn it into  
9 billable items on a customer's bills have settled down  
10 enough that we could even programatically tell our  
11 developers what we need them to do to make it work,  
12 because the rules are changing, or they will change,  
13 and there's all kinds of speculation, right?

14           So, until we have scale and until we have more  
15 certainty on what the rules will require, we're not  
16 doing software development, because these systems,  
17 again, utility billing systems are ugly things.  
18 They're not -- they don't use the same kind of  
19 contemporary technology that these organizations use.  
20 They're typically, you know, decades old things that  
21 are hard to customize, and so, when we do undertake  
22 customization, it is at the point where the volume and  
23 the requirements have lined up enough that we're doing  
24 it with confidence that we can do it once, do it right,  
25 and not have problems.

1           CHAIRMAN ROISMAN: I have a question for you.  
2 In your scenarios that were in your slides, you show a  
3 fairly steep growth in EV charging by 2025. It's a  
4 pretty big difference between today. You're going to  
5 have to address this problem. What's your timeframe?  
6 How soon before you will have solved the billing issue?  
7 Is it, is it next year? Is it 2024?

8           MR. OTLEY: So you, you -- I will turn that  
9 back to you. You will tell us that. Because, as soon  
10 as you guys issue --

11          CHAIRMAN ROISMAN: Well, we want to hear it.

12          MR. OTLEY: It's either the PUC or it's the  
13 legislature is going to put out some rules or guidance  
14 or statutes or regulatory orders or whatever form it  
15 takes about what we need to do, and that's how  
16 requirements start getting defined. You tell us the  
17 rules we have to follow, and we turn those into  
18 back-office requirements that we need to develop to  
19 make whatever rules that have been decided upon as  
20 cost-effective to operate as possible. So the two  
21 things that will drive that are the speed with which we  
22 get clarity on the rules we have to follow and the  
23 growth of that adoption curve.

24          CHAIRMAN ROISMAN: And so it's not a  
25 technological problem? I mean --



1           MR. OTLEY: We'll do it. I'm dying to do it.  
2 I'd love to do it tomorrow if we had that certainty,  
3 but, right now, it's a little bit unclear, and the  
4 volume of customers that are in this situation is small  
5 enough that we can muddle through doing it manually.

6           COMMISSIONER CHENEY: Mr. Lyle, I'm sure you  
7 have a different perspective.

8           MR. LYLE: Yeah. I'm just, like, I don't  
9 know where to jump in on this. To get back to the  
10 process in terms of billing under the residential EV  
11 rate, the discount that we were talking about that Mr.  
12 Dostis referred to, if, if it would help, if it's  
13 helpful, Page 9 on our February 15th filing, we kind of  
14 lay out the process of what BED is doing in terms of  
15 capturing the kilowatt-hours that we're pulling off the  
16 residential Level 2 charger. So trying to be as, as  
17 nuanced as I can with regard to the, the kilowatt-hour  
18 tax. We're absolutely opposed to it.

19           MS. LEVINE: That's very nuanced.

20           MR. LYLE: And I'd like to thank Sandy for  
21 her comments. We're opposed to it on a number of  
22 fronts, and I'll try and be quick about this. So, you  
23 know, as we went into great depth about our discounted  
24 rate for residential customers. You know, imposing a  
25 tax on that fee kind of undermines our, our, the

1 benefits that we're trying to put out there and to  
2 encourage folks to, to make the transition to EV.

3 So, you know, right now, you know, there's, it's  
4 about a 6-cent credit, and we still make, you know,  
5 recover our costs. You know, one penny, maybe not a  
6 big deal. But we reach, you know, we go to 4 cents,  
7 well, then folks start to think, weigh the pros and  
8 cons as to, Well, does it really matter? You know, do  
9 I go on the discounted rate as opposed to just buying a  
10 level, any kind of Level 2 charger off of Amazon and  
11 plug it in? And then you have the bypassable issue.  
12 So that was another reason.

13 So, you know, a tax at this time, I think, is just  
14 a headwind for the State, from a policy perspective, to  
15 encourage folks to make the transition, and I think the  
16 tax on kilowatt-hours is actually misplaced. The tax,  
17 if there is to be a tax, should be on gasoline and  
18 diesel. That's, that's the behavior we're trying to  
19 make the switch from to a cleaner grid. So I'd just  
20 kind of throw that out there. And Sandy brought this  
21 up, even though she's a lawyer, the math --

22 MS. LEVINE: Thanks.

23 MR. LYLE: -- if I could just compliment your  
24 -- so the math, in terms of, of -- so the publicly  
25 available chargers that we own, last year, over the

1 last 12 months, there was about 70,000 kilowatt-hours  
2 of usage. A 1-penny tax on that would raise \$700. So  
3 we don't really get the, understand quite the urgency  
4 at this time. So we will go back to our original  
5 comments as, Okay, yeah, taxing on a kilowatt-hour  
6 basis should be imposed at some time. We just don't  
7 think that that time is now.

8 An earlier VTrans report has suggested that, once  
9 the market share of EVs reaches 15 percent or so, maybe  
10 at that time we start to consider some sort of an  
11 increased tax for electric vehicles and plug-in  
12 vehicles. We're a long way from, from reaching that 15  
13 percent market share. Thank you.

14 MR. OTLEY: Yeah. So I'm going to agree with  
15 Tom. I think not now. No headwinds until we get  
16 higher adoption. I love the idea of maybe an  
17 alternative is raise the registration fee on, based on  
18 a, on a mileage efficiency of vehicles, right? So  
19 vehicles that are 100 miles per gallon, you know,  
20 equivalent or higher, it stays at the current fee.  
21 Anything over 50, you're paying a little bit more.  
22 Anything under 50 miles per gallon, you're paying a lot  
23 more, right? That's another way of kind of -- we want  
24 to reward the most efficient vehicles being on the  
25 road.

1           The third option, I see all over Vermont, Vermont  
2 DMV allows you to register for a truck plate, truck  
3 license plate. Doesn't allow you to register for an EV  
4 license plate, right? I bet many EV owners would be  
5 proud to pay a little extra to get an EV license plate  
6 on the front of their electric vehicle, be it a hybrid  
7 or an all EV. That's another way to think about  
8 raising some revenues without doing per-kWh.

9           MR. KNAUER: So I have a series of questions  
10 that I'll try to ask all at once. Is the per-kWh tax  
11 or fee proposal premised on a smart charger? Is the  
12 smart charger premised on it being connected to Wi-Fi  
13 at the house? Is Wi-Fi conditional upon high-speed  
14 internet at the house? Do we have enough high-speed  
15 internet in the state? For those that do have  
16 high-speed internet and Wi-Fi, will they grant the  
17 utility access? And I think that's about it for right  
18 now.

19           MR. OTLEY: You couldn't weave more of the  
20 state's problems in there?

21           MS. LEVINE: Sure, education is involved  
22 there too.

23           MR. OTLEY: What about population growth,  
24 could you get that in there? So to do the  
25 residential-level measurement of kWh to an EV load, you

1     need a charger that's going to capture that, and, if  
2     it's going to capture it and report it, it's got to  
3     have smarts, which means it's got to talk. We're using  
4     Wi-Fi for that connectivity, and, in our home-charging  
5     program, if a customer does not have Wi-Fi at home or  
6     broadband at home, we're not able to enroll them in the  
7     program.

8             MR. KNAUER: Are there other technology  
9     options that are not dependent on residential Wi-Fi?  
10    So does the --

11            MR. KARLEN: Yes. I mean, you could use  
12    cellular, but that would drive up costs.

13            MR. OTLEY: We just wove another Vermont  
14    problem, cellular coverage.

15            COMMISSIONER CHENEY: Mr. Allen?

16            MR. ALLEN: Yeah. I mean, I mean, this is,  
17    it's -- I feel like there's lots of prongs that I could  
18    go in. I mean, you could always just use traditional  
19    metering technology to separate out the load. It just  
20    has a very high up-front cost to have that separate  
21    meter there, but, yeah, you could go that route as  
22    well, or you could just kind of recognize that this is  
23    something that is happening kind of over time.

24            Just to be clear, what the Department is talking  
25    about is not a kind of foisting a major fee on

1 consumers to make up for the loss in transportation  
2 funds over the next six months but really to create a  
3 kind of a vision for how we're going to do this over  
4 time allowing kind of technology and -- I mean, I feel  
5 like the conversation around kind of the steps between  
6 moving the data from the Wi-Fi and charging stations to  
7 the billing system is just a red herring. That's not,  
8 in my mind, what this is about. They're able to do  
9 that currently, and, if they had to do that, I mean,  
10 the charge would come with it.

11 But what I'm, what we're really trying to put in  
12 place is something that we feel sensibly should be done  
13 before this is a problem, before we've faced a major  
14 problem. This isn't the kind of problem that you want  
15 to wait until you reach a time where we have major  
16 penetration of electric vehicles and then we're having  
17 the conversation, because then we're going to have a  
18 very hard time trying to figure out which way this  
19 goes.

20 We do feel that this does relate to the usage of  
21 the roads. This is, these costs these vehicles impose,  
22 the costs of wear and tear on the roads, granted  
23 weather is probably a disproportionate factor in a  
24 state like Vermont, but larger vehicles and vehicles  
25 generally also contribute to the wear and the tear of

1 the road, and there's a fairness issue. There's,  
2 they're users of that system. So we feel that that is  
3 a sensibility as well.

4 In terms of high-speed, I could go -- that's a  
5 day-long conversation, and it is something that we're  
6 trying to move on multiple fronts to address, but,  
7 granted, that's a barrier. I think we're down to, you  
8 know, to a very small percentage of the state -- I  
9 think it's in the neighborhood of 17 percent, but it's  
10 up on our website -- that is down to a point where you  
11 can't get the, at least the 4/1, 4 download,  
12 1-megabit-per-second upload speeds, and so we're doing  
13 pretty good.

14 We think that's only going to improve. We don't  
15 think that that's going to be the major barrier over  
16 time. Chances are, if you're buying a Tesla, you  
17 probably do have pretty good alignment between access  
18 to technology, and there's not going to -- I mean, you  
19 may, there may be a Tesla owner way out in the  
20 Northeast Kingdom away from broadband and fairly  
21 advanced systems, but we feel like that's not, that's  
22 not a good reason for not essentially moving in this  
23 direction. We think we can get kind of most of what is  
24 there by, by moving on this front. I do have other  
25 responses to other things, but I think I'll pause.

1 MS. BAILEY: Yeah. I just wanted to weigh  
2 in. VPPSA is of the belief that we do need a  
3 long-term, sustainable policy to replace lost  
4 transportation fund revenue that encompasses all  
5 vehicles, including EV owners and out-of-staters, but  
6 we do think that these goals can be better met with the  
7 vehicle-miles-traveled or registration fee coupled with  
8 a per-kilowatt-hour fee at public charging stations and  
9 that that would come at a much lower cost.

10 We've heard all of the utilities saying this is an  
11 extremely labor-intensive and expensive integration  
12 project that certainly we will undertake if we get that  
13 direction from the Commission or the legislature, but I  
14 have not -- we haven't yet heard the state agencies  
15 articulate why a vehicle-miles-traveled or a  
16 registration fee wouldn't accomplish the same goals at  
17 a considerably lower price, and it's hard to imagine  
18 that the implementation would be as costly.

19 Privacy concerns have been raised. I'm not sure  
20 how those are different. If you know exactly how many  
21 kilowatt-hours an electric vehicle driver is charging,  
22 you can easily make the leap to how much they're  
23 driving. So I'm not sure about the privacy concerns.  
24 And I, it seems like this concept of charging a  
25 per-kilowatt-hour fee that is coupled with rate design,



1 again, it's not a foregone conclusion that rate design  
2 is the best way to incentivize these vehicles.

3 I think it's worth pointing out that, down the  
4 road, that delta between the overall residential rate  
5 and a preferred EV charging rate may disappear, right?  
6 As they become ubiquitous and everybody has an EV,  
7 there may no longer be much of a delta. The  
8 calculations show that, in order to capture the  
9 equivalent of what's paid in a gas tax, you'd need a  
10 4-cent charge per kilowatt-hour so, unless there is  
11 that delta that, that would encourage people to go onto  
12 the EV rate, they would naturally begin to undertake  
13 behaviors to avoid the tax if it was at that level.

14 So, I think, in terms of a long-term solution, we  
15 need to not assume that we are always going to have a  
16 6-to-8-cent difference between a residential rate and  
17 an EV charging rate. I think I'll leave it there.

18 MR. COTTER: I'm just curious. So we're  
19 starting to see sort of the difference between, you  
20 know, there's some folks here that think the vehicles  
21 miles traveled is a better approach and some folks that  
22 think the kilowatt-hour approach is better. For the  
23 people that support the vehicle miles traveled, are  
24 you, is it your position that what we should be doing  
25 is moving -- I heard you said all vehicles, and then

1 you said hybrids and EVs. Are we talking about moving  
2 everybody so we're getting rid of the gas tax, in other  
3 words, and let's just go to vehicle miles traveled for  
4 every vehicle, or are we going to have a split system?

5 MS. BAILEY: I mean, our position is that  
6 that should -- eventually, we'll be transitioning away  
7 from fossil fuels and we need to have a sustainable  
8 mechanism in the future and that this would apply to  
9 all vehicles going forward and would -- I don't think  
10 we need to be wedded to something that's comparable to  
11 the gas tax, because we charge a tax now per gallon of  
12 gas that we then need to find an equivalent solution  
13 for electricity and charge a per-kilowatt-hour fee.  
14 This would be an administratively simpler and less  
15 costly tax.

16 MR. COTTER: Yeah. What I was getting at  
17 was, I get that, at some point, we probably are just  
18 going to be an electric vehicle world but that there's  
19 going to be a transition time where, say, it's going to  
20 take a while to even get to the half electric and half  
21 fossil fuel. When we're at that point, are we still  
22 talking about gas tax for that 50 percent of the  
23 vehicle fleet that's fossil-fueled and vehicle miles  
24 traveled for electric, or are we talking about let's  
25 just, if we're going to do the electric thing that way,

1 let's do the fossil fuel thing that way too? Which, I  
2 think, gets at Ms. Levine's concern that the more  
3 efficient these cars get, the less money we collect,  
4 and there seems to be a resistance to actually raise  
5 the gas tax generally. So I'd just, what -- how about  
6 you, Ms. Levine? You brought it up.

7 MS. LEVINE: Yeah. I think one should figure  
8 out a solution that works for whatever vehicles are out  
9 there and however they're powered, and I think  
10 something like a vehicle's miles traveled, I believe,  
11 it's Oregon has a combination vehicle miles traveled  
12 and weight, because weight's also something that  
13 affects wear and tear on the roads.

14 But, you know, users pay is a, is a common thing  
15 that I think the Public Utility Commission understands  
16 better than many policy people do, and so moving  
17 everybody towards the same way of paying for the roads  
18 probably makes sense. And then it's, then it's likely a  
19 matter of, you know, of, you know, feathering it. It's  
20 probably not going all happen overnight, but you can,  
21 you know, start with a lower vehicle-miles-traveled fee  
22 and move that up.

23 That said, there are probably other good reasons  
24 to have a gasoline tax or a tax on fossil fuels,  
25 because you want to discourage that use going forward,

1 but that may not necessarily be just because that's how  
2 you would fund your roadways.

3 MR. COTTER: Right. My understanding is that  
4 the tax that we pay per gallon on gasoline, only a  
5 portion of it goes to road maintenance. Other parts  
6 are for, like, environmental remediation and things.  
7 So, when I say get rid of the gas tax, I was referring  
8 to the transportation infrastructure portion of it,  
9 but, yes, I realize there are other reasons to keep  
10 some in place.

11 COMMISSIONER CHENEY: I want to get a read of  
12 the room for a minute, because I think you're going to  
13 need a break in a minute. We were hoping to wrap this  
14 up by 3:30. We don't want to end the discussion,  
15 though, as long as it's fruitful. So are, do you think  
16 you have a lot more to say on this subject? Yes? No?

17 MS. COHEN: Quick comment.

18 COMMISSIONER CHENEY: Okay. So maybe, maybe  
19 we should take a five-minute break or a ten-minute  
20 break. Okay. Ten-minute break.

21 (A recess was taken from 3:23 p.m. to 3:37 p.m.)

22 COMMISSIONER CHENEY: So we'll pick right up  
23 where we left off, and, Ms. Cohen, I believe you had  
24 your hand up.

25 MS. COHEN: Thank you. VEC agrees with a lot

1 of what we heard from CLF and the other utilities.  
2 I'll just start by saying, Yes, EV users should pay  
3 their fair share of roads and bridges. We just don't  
4 think it's the per-kWh fee, and the primary reason is  
5 mostly having to do with the cost of implementation,  
6 the administrative costs of that. The one example we  
7 gave was, Well, if we're going to spend \$70, \$60 a year  
8 to collect \$70, you know, is that really good fiscal  
9 policy? Is that really good tax policy? And isn't  
10 there a lower cost way to collect revenue from EV  
11 users?

12 And there were some alternatives offered about  
13 registration fees or vehicle miles traveled, you know,  
14 annually as part of annual inspections as well as maybe  
15 the public charging stations to access the, the  
16 out-of-state or the visitors. So that is more along  
17 the lines with the things we're thinking. And, also,  
18 the fairness of the behind-the-meter Level 1 and Level  
19 2, we really don't think you should start tax policy,  
20 you know, the fairness issue without making sure that  
21 all those compliance points are really in. We'd rather  
22 get it right than do it sooner, so let's take our time  
23 and get it right.

24 CHAIRMAN ROISMAN: And I had a question for  
25 those of you who are supportive of the

1 vehicle-miles-traveled approach. How do you deal with  
2 the problem that you probably bill that once a year  
3 and, for lots of people, a bill of that size is a  
4 significant charge? If you do it with the registration  
5 fee, you're just putting it on at the beginning.

6 The beauty of the gas tax, which would be true for  
7 the kilowatt-hour tax, would be that it's just a little  
8 bit all along and it's more painless. So how, what do  
9 you suggest is the way to cope with that? How would we  
10 deal with that if we went with the  
11 vehicle-miles-traveled approach?

12 MS. COHEN: No, that's a great question. I  
13 think some of that has to do with how much are we  
14 charging ultimately. I've heard different numbers, and  
15 I don't know, you know, what we're looking to extract  
16 from EV drivers. Is it \$170 a year? Because I've  
17 heard that number thrown around. That's the equivalent  
18 of the average of what people pay for the gas tax. I  
19 don't know if that's a good number or not. And it  
20 could be an up-front, an annual and then, you know,  
21 inspection. There could be some ways around that.

22 There's also been things tossed around, you know,  
23 we collect on the gross usage for efficiency right now,  
24 and, you know, should a piece of that, you know, be  
25 taken for these kinds of programs, you know, for

1 vehicle incentives? Like, is there systems already  
2 place so we're not creating a new system that has costs  
3 associated with it?

4 MR. DOSTIS: I wonder if you can register  
5 your electric vehicle as you would any other time and  
6 pay whatever it is we pay, and maybe you get a bill  
7 when you register that you have 12 months to pay for  
8 the hundred, whatever the amount is, whatever that  
9 dollar amount is, and then people can pay it back over  
10 time.

11 COMMISSIONER CHENEY: So I'm intrigued by  
12 what you said about the percentage on gross use the  
13 same way the efficiency charge is raised. Does anyone  
14 have a sense of how much bigger an electric bill gets  
15 when using your, you know, home charger? So,  
16 presumably, your electric efficiency charge would go up  
17 too. What kind of proportionality are we talking  
18 about?

19 MR. KNAUER: Mr. Miller earlier said it's  
20 like plugging a house into your house.

21 MR. MILLER: A little shy. I can follow up  
22 with --

23 CHAIRMAN ROISMAN: Yeah, you thought 3 or  
24 4,000 kilowatt-hours right?

25 MR. MILLER: There was a number that was

1 quoted earlier, and I can follow up.

2 COMMISSIONER CHENEY: So it's an interesting  
3 idea. One would have to think about whether it would  
4 be fair to double down on the percentage on gross given  
5 that they would also be paying more for the electric  
6 efficiency charge. Interesting.

7 MR. WESTMAN: I'll say that the electric  
8 efficiency charge is also a discussion at the State  
9 House in the same context as this transportation  
10 charge, and that is a policy that's being discussed in  
11 the applicability for how the efficiency charge could  
12 be used to benefit electric vehicle customers, either  
13 for more efficient forms of transportation or more  
14 services for those, for that, for that specifically.  
15 So that's, that's up for policy discussion.

16 But, I mean, for everyone's context, we assume a  
17 residential home gets about a 6-dollar-a-month  
18 efficiency charge, and so, if you plug a house into  
19 your house, then your vehicle has about a \$6 charge, I  
20 mean, if we're just taking that rule of thumb.

21 MR. MILLER: Two brief points just on  
22 compliance to emphasize some issues that had been  
23 flagged earlier. It is a real challenge from a  
24 semi-outsider's perspective in the room to ensure  
25 compliance in a kilowatt-hour pricing scheme. In fact,



1 to illustrate that, the residential challenge for  
2 compliance is so daunting that the Iowa legislature is  
3 also looking at this issue as we speak, and I'll be  
4 heading to Des Moines next week. They're looking at  
5 holding residential charging entirely harmless,  
6 notwithstanding the fact that 60 percent of charging  
7 takes place there, so the goal of the program to  
8 recover those fees based on use isn't being met.

9 And then one piece related to that is, if we see  
10 defection from complying with behind-the-meter Level 1  
11 or non-networked Level 2, that would lead to an  
12 inequitable situation where, amongst EV drivers in and  
13 of themselves, it would be collected inconsistently so  
14 that drivers that don't have access to dedicated  
15 overnight charging would, in effect, pay more, because  
16 they would be charging more in public, and those  
17 inequity issues would be challenging as well.

18 COMMISSIONER CHENEY: So is Iowa thinking of  
19 putting a tax on the public charging that would go into  
20 the road fund, or --

21 MR. MILLER: It's an issue that's in flux,  
22 and it's been considered in a number of different  
23 jurisdictions, which is why in Oregon, as was cited  
24 earlier, they're already piloting VMT. I think it's a  
25 common issue, and wrapping one's head around a

1 long-term solution is critical, but what's the right  
2 short-term solution to get us there, right, as we  
3 establish the new regime that's going to be the one  
4 solution moving forward?

5 MR. KARLEN: Let me just put it this way.  
6 You would think that a kilowatt-hour approach would be  
7 something that would get, you know, the Greenlots and  
8 the ChargePoints of the world very excited, right?  
9 Because that would implicate serious investments in  
10 chargers and software and programs just to facilitate  
11 that. So it should say a lot that, you know, we  
12 submitted six pages of, you know, arguments for a VMT  
13 approach instead, and the reason for that -- I can  
14 speak for ourselves -- is we want those investments to  
15 be made for the right reasons, and we want there to be  
16 long-term, sustainable policy for collecting  
17 transportation fees.

18 I, I can leave it at that, but there's, more  
19 broadly, as CLF talked to pretty articulately, this is  
20 a much broader problem than EVs. EVs are a nice poster  
21 child for this issue, but it's only a small percentage  
22 of the revenues that have been in decline for years.  
23 It's largely been a result of state policy to increase  
24 efficiency, right? So EVs is, they're a nice poster  
25 child for it, but the problem is much bigger, and we

1 would instead probably encourage, you know, Vermont to  
2 be a leader like Oregon is to try to work out some, you  
3 know, more broad, long-term solutions. We see that as  
4 being an opportunity there. So that's our thoughts.

5 COMMISSIONER CHENEY: Graham.

6 MR. TURK: Just real quick, I know it's been  
7 mentioned a few times that we will get to 100 percent  
8 electric in our transportation. I don't doubt that. I  
9 think the issue is really speed. If we achieve that  
10 number by 2050 but haven't done anything in the next  
11 ten years, we've wasted our window that we have to  
12 transform our system radically in order to achieve the  
13 changes we need to get emissions down.

14 You can insert groans here, but the IPCC report  
15 from last fall is that we have a 12-year window to  
16 prevent serious, catastrophic warming above 1.5 degrees  
17 Celsius. So the speed issue and urgency is really  
18 front-of-mind. The last thing we want is another  
19 barrier for EV adoption. People respond much more  
20 strongly to negative incentives than positive, and so  
21 keeping this pushing forward towards more EVs, I think,  
22 is really important.

23 MS. O'TOOLE: Megan O'Toole from the Agency  
24 of Natural Resources. I just wanted to add a couple  
25 points that I think are relevant to the conversation.

1 First of all, I think we saw this morning, and I know  
2 everyone in this room has seen before, the evidence  
3 that incentivizing electric vehicle purchases causes  
4 people to buy more electric vehicles, and so ANR is not  
5 supportive of any near-term approach that would  
6 disincentivize EV adoption by increasing fees in the  
7 near term, but we do think that these, the pathway  
8 forward for determining how vehicles should pay their  
9 fair share into the transportation fund should be  
10 thought about early on and, and move towards a good  
11 solution.

12 And I also just wanted to mention, because it's  
13 been the, the administrative burden surrounding a VMT  
14 approach versus a per-kilowatt-hour fee approach has  
15 been talked about, and just, you know, from my  
16 experience, knowing the administrative burden  
17 associated with a lot of programs that we operate in  
18 Vermont regarding people and their motor vehicles,  
19 those programs are incredibly burdensome from an  
20 administrative perspective, and when you look at, like,  
21 the motor vehicle inspection program, which is a  
22 program that deals with individual people and  
23 individual vehicles and certain data and compliance  
24 regarding those vehicles, that is an incredibly complex  
25 program and very administratively burdensome for the

1 State to administer. So I think that it's important to  
2 mention that any VMT system that is operated and  
3 administered by the State would not be a walk in the  
4 park.

5 CHAIRMAN ROISMAN: Can I ask a question about  
6 that? I understood that, when I have my car inspected,  
7 that there's a computer connection that's made between  
8 my car and the Department for part of the process. Is  
9 that true? Does my, my car, which has a built-in  
10 computer in it, make a connection with the Department  
11 in some way at the time that I'm getting inspected?

12 MS. O'TOOLE: Yes, it does. As of last year,  
13 the inspection program for motor vehicles is completely  
14 automated. So an electronic tool is plugged into the  
15 car's computer to determine whether or not its emission  
16 control devices are operating as they should. And so  
17 that data is relayed automatically back to the  
18 Department of Motor Vehicles, and, whenever your  
19 vehicle is inspected, there's a whole host of other  
20 data that is collected about it manually.

21 COMMISSIONER HOFMANN: Is the odometer  
22 reading done automatically?

23 MS. O'TOOLE: I believe that's still a visual  
24 check. I don't know if the on-board diagnostic system  
25 looks for anything beyond compliance with emission

1 controls.

2 CHAIRMAN ROISMAN: But it could, right?

3 MS. O'TOOLE: I don't know the answer to  
4 that.

5 MR. COTTER: Do you know how -- at what point  
6 in the history of cars do you not have the ability to  
7 do that? Like, how new does the car have to be, or are  
8 there even current cars that are available that just  
9 are of a lower price point that don't have the capacity  
10 to do that?

11 MS. O'TOOLE: So vehicles that are compatible  
12 with on-board diagnostic controls, at least for this  
13 generation of OBD, were, I think, began to be  
14 manufactured in the late 1990s, like '98, '99. So I  
15 think you can generally -- and we require all motor  
16 vehicles 1996 and newer to be given that electronic  
17 test.

18 MR. COTTER: Okay. That's better than I  
19 thought.

20 COMMISSIONER CHENEY: Any other comments or  
21 questions on this issue? All right. Let's talk about  
22 next steps then. As you know, we need to and we will  
23 be submitting a report the legislature by July 1st  
24 2019. We do think we have more areas to explore,  
25 including more granularly what kind of education needs

1 to happen to communicate the benefits of driving  
2 electric, what public charging capacity may be needed  
3 and where, what role state government can play and  
4 others.

5 So, if we consider the state goal of reaching  
6 50,000 vehicles by 2025, we need to explore every way  
7 that could possibly happen. Those are some ideas for  
8 the next workshop. What we're going to be doing is  
9 noticing a probably final workshop before we start  
10 gathering our thoughts and writing the report. If you  
11 have any ideas on what else we could or should explore  
12 that we haven't touched on during these three  
13 workshops, please let us know, and we will be in touch  
14 with you, too, about the date and the exact topics and  
15 perhaps what information we might like from you for  
16 that workshop.

17 CHAIRMAN ROISMAN: And I think the current  
18 perception of this report is that it will not just be a  
19 report, this is what we heard, but that they will be  
20 expecting us to make recommendations. So, to the  
21 extent that you all submit us information, if you want  
22 to put all your thoughts together in sort of some final  
23 document that says, We think you should be recommending  
24 "X" and here's why, that would be a good thing to do  
25 and would help us tremendously in just in pulling

1 everything together. So, for those of you who are  
2 familiar with our normal hearing procedures, think of  
3 it as the post-hearing brief, and that, that will be  
4 very helpful.

5 And in this last session we will want to talk a  
6 lot about this topic that all of you mentioned in, in  
7 these reports that you just filed with us. Public  
8 education, how do we make people aware of all the  
9 options that they now have available, what the economic  
10 advantages are of switching, what the social advantages  
11 are of switching, you know, all of that. What, what  
12 people are doing and what people could be doing they  
13 aren't doing, what the State can do. And don't be  
14 reluctant to include ideas on things you think the  
15 State should do. This is going to the legislature  
16 eventually, so that will be an important thing to know.

17 COMMISSIONER CHENEY: Yes. And I use the  
18 word "report" generically. In fact, the legislature  
19 specifically asked us to make recommendations including  
20 on the topic we were just discussing and, more broadly  
21 speaking, to identify the barriers to widespread and  
22 robust EV deployment in Vermont and but, beyond  
23 identifying them, how we can remove them, and not just  
24 cars, but charging stations. What are the barriers?  
25 How can we remove them? Ms. Levine, you have your hand



1 up.

2 MS. LEVINE: Yes. I was wondering if the  
3 Commission would consider sharing a draft report prior  
4 to sending it to the legislature that people involved  
5 could comment on.

6 COMMISSIONER CHENEY: We will consider that.

7 MS. LEVINE: Thank you.

8 COMMISSIONER CHENEY: We'll let you know.

9 MR. COTTER: It depends on how fast Tom  
10 drafts it.

11 MS. LEVINE: You know, sometimes it feels  
12 like we provide input and don't know what you're doing  
13 with it.

14 COMMISSIONER CHENEY: Yes, and, in fact, I  
15 think, especially in this workshop in all my experience  
16 here, the participation in this subject has been so  
17 helpful, and, as I said earlier, people have come from  
18 a distance, right? You come to Vermont. You're going  
19 to Iowa next week, right?

20 MR. MILLER: Vermont's my favorite, though.

21 COMMISSIONER CHENEY: Oh, I know you're not  
22 in Vermont. So we're not only grateful, but we  
23 actually are benefiting a lot from this really robust  
24 participation, so thank you. Mr. Allen?

25 MR. ALLEN: Just a question. I mean, I

1 mentioned that I am going to send the report that we  
2 did on demand charges to this, as part of this  
3 proceeding. If there are other things that we would  
4 like you to consider, do we have license to essentially  
5 just send them in as part of this docket for you to  
6 consider, or is that --

7 COMMISSIONER CHENEY: Yes. Remember, this is  
8 a workshop, not a contested case, so yes.

9 MR. ALLEN: Okay.

10 MR. COTTER: I would just point out that the  
11 rules for electronic filing do allow the Commission to  
12 suspend somebody's right to use ePUC if they get  
13 abusive.

14 COMMISSIONER CHENEY: All right. There's,  
15 seeing no other work in front of us, thank you again,  
16 and we'll see you next time.

17

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19

20 (Whereupon at 3:56 p.m. the hearing was adjourned.)

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