

ORIGINAL

RE: DE 24-070

PUC HEARING

October 08, 2024



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STATE OF NEW HAMPSHIRE

PUBLIC UTILITIES COMMISSION

October 8, 2024, 9:01 a.m.
21 South Fruit Street, Ste. 10
Concord, New Hampshire

ORIGINAL

RE: DE 24-070
Public Service Company of New Hampshire
d/b/a Eversource Energy
Request for Change in Distribution Rates
(Prehearing Technical Session, Day 3)

PRESENT: Chairman Daniel C. Goldner, Presiding
Commissioner Pradip K. Chattopadhyay
Alex Speidel, Legal Advisor
Tracey Russo, Clerk

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APPEARANCES:

Reptg. Public Service Company of
New Hampshire d/b/a Eversource Energy:

Jessica A. Chiavara, Esq.
Jonathan A. Goldberg, Esq. (Keegan Werlin)

Reptg. Residential Ratepayers:

Donald M. Kreis, Esq., Consumer Advocate
Matthew Fossum, Asst. Consumer Advocate
Michael J. Crouse, Esq.

Reptg. New Hampshire Dept. of Energy:

Paul B. Dexter, Esq.
Alexandra Ladwig, Esq.
Molly Lynch, Esq.
Jay Dudley, Utility Analyst
Jacqueline Trottier, Utility Analyst

Reporter: Nancy J. Theroux, LCR, RPR #100
(RSA 310-A:161-181)

1 APPEARANCES: (Continued)

2

Reptg. AARP:

3

Christina FitzPatrick, NH Director

4

Patrick McDermott

John Coffman (remotely)

5

6

Reptg. Clean Energy New Hampshire:

7

Chris Skoglund, Director of Energy Transition

8

Reptg Conservation Law Foundation:

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Nicholas Krakoff, Esq.

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ALSO PRESENT:

14

PSNH, d/b/a Eversource Energy:

15

Lavelle Freeman

Doug Horton

16

Robert Coates

Ashley Botelho

17

Dominick Brescia

Brian Dickie

18

Paul Renaud

Sandra Gagnon

19

Warren Boutin

Mark Kolesar

20

Agustin Ros

Andrew Belden

21

Dr. Elli Ntakou

Dr. Gerhard Walker

22

Matt Cosgro

23

1 APPEARANCES: (Continued)

2 REMOTE PARTICIPANTS:

3 Marc Lemenager
4 Nicholas Crowley, Consultant
5 Donna Mullinax, Consultant
6 John Coffman, AARP
7 Adam Aguirre, CLF
8 Fatou Dieng
9 Jennifer Schilling
10 Shamus O'Brien
11 Steven Casey
12 James DiLuca

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1 P R O C E E D I N G

2 CHAIRMAN GOLDNER: Okay. Good
3 morning. I'm Chairman Dan Goldner. I'm here
4 today with Commissioner Pradip Chattopadhyay.
5 This is day 3 of the Prehearing Technical
6 Conference attended and presided over by the
7 Commission regarding the Eversource
8 performance-based ratemaking or PBR proposal
9 presented to the Commission in its distribution
10 rate case docketed in DE 24-070.

11 Today's technical conference
12 conversation is focused on expected interplay
13 between the Company's PBR proposal in general and
14 the Distribution Solutions Plan concept also put
15 forward by Eversource in its rate case filing.

16 This also includes solar installations
17 that would be built and owned by Eversource,
18 though it is not clear whether this would be
19 accomplished under the statutory framework
20 established under RSA Chapter 374-G.

21 We'll now take roll call, beginning
22 with the Company, acknowledging that certain
23 parties were not here last Thursday. Eversource.

1 MS. CHIAVARA: Yes. Good morning,
2 Commission. Jessica Chiavara, here on behalf of
3 Eversource Company of New Hampshire, doing
4 business an Eversource Energy, and I have
5 co-counsel here with me today, Jonathan Goldberg,
6 Senior Counsel at Keegan Werlin.

7 CHAIRMAN GOLDNER: Very good.

8 AARP.

9 MR. COFFMAN: John Coffman here on
10 behalf of AARP, New Hampshire.

11 CHAIRMAN GOLDNER: Okay. Thank you.

12 Alexander Cook. (No response.)

13 Clean Energy New Hampshire. (No
14 response.)

15 The Community Power Coalition of New
16 Hampshire. (No response.)

17 The Conservation Law Foundation.

18 MR. KRAKOFF: Good morning,
19 Commissioners. Nick Krakoff for the Conservation
20 Law Foundation.

21 CHAIRMAN GOLDNER: Thank you.

22 Rate LG Customer Consortium. (No
23 response.)

1 Mary Ellen O'Brien Kramer. (No
2 response.)

3 NECTA. (No response.)

4 The New Hampshire Department of
5 Energy.

6 MR. DEXTER: Good morning,
7 Mr. Chairman, Commissioner. Paul Dexter from the
8 Department of Energy. I'm joined by Alexandra
9 Ladwig and Molly Lynch from the Department's
10 legal division and Jay Dudley and Jacqueline
11 Trottier from the Department's regulatory
12 division.

13 CHAIRMAN GOLDNER: Thank you.
14 The Office of the Consumer Advocate.

15 MR. CROUSE: Good morning,
16 Commissioners.

17 In addition to my introduction, I just
18 had two very brief observations that would be
19 useful to the Commission.

20 My name is Michael Crouse, staff
21 attorney for the OCA representing residential
22 ratepayers. The first notice to the Commission
23 is that the Consumer Advocate, due to a medical

1 appointment, will be joining us in 30 minutes.

2 The second notice is that last week,
3 there were some microphone disturbances. I
4 observed that the microphone to my left was
5 making and picking up noise even when off, and
6 thought I would let you know. Thank you.

7 CHAIRMAN GOLDNER: Okay. Thank you,
8 Attorney Crouse.

9 Standard Power of America.

10 (No response.)

11 And, finally, Walmart. (No response.)

12 Okay. Are there any other persons or
13 entities wishing to be acknowledged today?

14 MR. CROWLEY: If I may, I'm Nick
15 Crowley with the Department of Energy. I'm a
16 consultant to the Department of Energy.

17 CHAIRMAN GOLDNER: Okay. Thank you,
18 Mr. Crowley.

19 Okay. Thank you. So we have a few
20 follow-up questions from the last proceeding.
21 Then I believe the Company is planning to make a
22 presentation relative to DSP today?

23 MS. CHIAVARA: That's correct. Yes,

1 we have some slides prepared.

2 CHAIRMAN GOLDNER: Okay. Thank you.
3 Can the Company file that presentation with the
4 Clerk's Office?

5 MS. CHIAVARA: Absolutely.

6 CHAIRMAN GOLDNER: Okay. Thank you.
7 And I think you sent the initial
8 PowerPoint presentation from the first PBR -- I'm
9 sorry -- from the first PHC in already. Any
10 concerns with posting that as well?

11 MS. CHIAVARA: No. That should be
12 fine.

13 CHAIRMAN GOLDNER: Okay. Okay. So
14 thank you. So after some initial questions --
15 pardon me -- from the Commission and the
16 Company's presentation, we'll continue with
17 Commissioner questioning regarding the interplay
18 between the DSP and the Company's solar PB
19 build-out and performance-based ratemaking. And
20 I'll just ask if any the other participants here
21 today plan to ask questions of the Company for
22 planning purposes today.

23 MR. DEXTER: Thank you, Mr. Chairman.

1 The Department doesn't have any prepared
2 questions, but would like the opportunity to ask
3 some follow-up after hearing the presentations.

4 CHAIRMAN GOLDNER: Okay. Thank you.
5 Attorney Crouse?

6 MR. CROUSE: The OCA has no prepared
7 questions at this time. Thank you.

8 CHAIRMAN GOLDNER: Okay. Anyone else?

9 MR. KRAKOFF: Commissioners, I have no
10 prepared questions, but I reserve the right to
11 ask a few follow-up questions.

12 CHAIRMAN GOLDNER: Okay. Of course.

13 MS. CHIAVARA: And, Mr. Chairman?

14 CHAIRMAN GOLDNER: Uh-huh.

15 MS. CHIAVARA: We also prepared a few
16 slides on the DSP, just an overview. It's
17 nothing new, but it's just a -- sort of an
18 executive summary of what we actually filed, and
19 we thought it might be of assistance to get the
20 conversation started off. We can present
21 evidence, if you like, after we address last
22 week's follow-up questions.

23 CHAIRMAN GOLDNER: Perfect. Yes, that

1 was the plan. Yes, exactly.

2 Okay. Just a moment.

3 (Conferring.)

4 CHAIRMAN GOLDNER: The only other item
5 is that -- I'll just highlight -- that just as
6 with the prior sessions, we'll take regular short
7 breaks, a one-hour break at noon, and we plan to
8 be completed by 4:30 -- no later than 4:00, I
9 should say.

10 Okay. So let's begin. Let me just
11 start with a couple of follow-up questions on the
12 last session.

13 So I wanted to start with -- I
14 appreciated Mr. Crowley and the DOE's questions
15 on Thursday, and I'd like to follow up on that.
16 And what the Commission would like to see from
17 the Company is what I'll call the governing
18 equation for the Company's revenue requirement.
19 You provided a governing equation for PBR,
20 though, I think we discovered last week, it was
21 incomplete. And so in that governing equation
22 would be everything in the revenue requirement,
23 so what's inside PBR, what's outside PBR, the

1 other factors, all in equation form, so that we,
2 the Commission, and the other parties can
3 understand exactly what your ask is for the
4 revenue requirement.

5 Any concerns on that, Attorney
6 Chiavara?

7 MS. CHIAVARA: No concerns. And I do
8 believe we've prepared something to that effect
9 for today.

10 CHAIRMAN GOLDNER: Okay. Great.

11 MS. CHIAVARA: I'm sorry. I believe
12 we are still trying to get access to the screen
13 to present, so I'm --

14 CHAIRMAN GOLDNER: Then, secondly, I
15 also appreciated Mr. Dudley's question from last
16 Thursday. And, admittedly, speaking only for
17 myself, I still don't understand Mr. Horton's ROE
18 analysis. And I know, Attorney Chiavara, you
19 took a note on this, but I'd like to make sure
20 the Company puts pen to paper on how this would
21 work. You know, PBR's sort of foundational
22 premise is that it encourages the Company to
23 control expenses, so this is regarding

1 foundational. And so I think it's best if the
2 Commission understands exactly what the Company
3 is putting forward and how PBR helps the Company
4 control expenses.

5 And Mr. Horton made a reply to
6 Mr. Dudley at the last session, and -- and so I'd
7 just like to follow up on that and make sure --
8 the Commission, for sure, and the Department and
9 the other parties also understood the Company's
10 position.

11 Okay. The clerk's have just sent
12 Attorney Chiavara another link, so if you can
13 check your email, you should have another
14 linkage.

15 And I'd also like to thank Attorney
16 Krakoff for his questions. I have no follow-up
17 on those questions, but the questions were
18 helpful to us last week, Attorney Krakoff, so I
19 thank you for that.

20 And I'll turn now to Commissioner
21 Chattopadhyay to see if he has any follow-up
22 questions from last week.

23 CMSR. CHATTOPADHYAY: I do not. Thank

1 you.

2 CHAIRMAN GOLDNER: Okay. And
3 would the -- just making sure that we keep things
4 moving, would the Company be able to file all
5 these analyses and the other items that we asked
6 for last week by 10/22, a couple of weeks? Would
7 that be enough time?

8 MS. CHIAVARA: Yes, that should be
9 fine. Subject to check, but yes.

10 CHAIRMAN GOLDNER: Okay. Thank you.
11 And if you need longer, just file something, and
12 that's probably not an issue. I'm just trying to
13 keep the wheels rolling.

14 And at this point, assuming the
15 Company is ready, we're ready to move on to the
16 Company's presentation.

17 MS. CHIAVARA: The email just made it
18 through Eversource's excellent firewall, so it
19 took just a moment to get to us.

20 MS. BOTELHO: I'm not able to get on.
21 It's not starting.

22 (Conferring.)

23 CHAIRMAN GOLDNER: Yeah, let's just

1 take a five-minute break and get the Company some
2 time to sort of get things settled in without
3 feeling hurried, and we'll just return in five
4 minutes.

5 (Recess taken.)

6 CHAIRMAN GOLDNER: Okay. We'll go
7 back on the record. And I'll move over to you,
8 Attorney Chiavara and Eversource.

9 MS. CHIAVARA: Thank you,
10 Mr. Chairman. I believe Ashley Botelho is going
11 to start this presentation; is that correct?

12 MS. BOTELHO: We have Lavelle starting
13 with the DSP.

14 (Conferring.)

15 MR. FREEMAN: Good morning,
16 Commissioners. My name is Lavelle Freeman. I'm
17 Director of Distribution System Planning. A
18 pleasure to be before you once again.

19 I will take about 20 minutes to walk
20 through 17 slides on the distribution system in
21 New Hampshire and our distribution planning
22 methodology. I welcome questions as we go
23 through. I think that will add to the tenor of

1 the discussions.

2 And then after that, I will pass it to
3 my colleague, Paul Renard, who will talk about
4 the capital expenditure and the distribution
5 system assessment. Next slide, please. Next
6 slide.

7 So the distribution system in New
8 Hampshire is really subdivided into five regions,
9 which are aligned with our operational districts.
10 The northern region stretches from Concord to
11 Pittsburg. It's really the largest, by far,
12 region. And it's really two electrical areas, if
13 you think about it, is Concord to the White
14 Mountains, and then White Mountains north, to the
15 north.

16 And this region -- and I will talk
17 about it as we get into some of the planning
18 challenges, really presents as a region with
19 really, really long feeders and, historically,
20 lower reliability than seen in other portions of
21 the state, which portends some the planning
22 challenges and solutions for this region.

23 The central region is really the

1 greater Manchester area. It includes an area
2 following I-89 up towards Hopkinton.

3 The eastern region comprises New
4 Hampshire's seacoast, the Epping area and the
5 tri-city region of Dover, Somersworth, and
6 Rochester. And this is probably the
7 fastest-growing region in our district. Some of
8 the step loads are the largest loads that exist
9 that we're seeing driving our planning solution
10 in this region.

11 And the southern region is the greater
12 Nashua area, including areas around Milford and
13 Derry.

14 And, finally, the western region
15 comprises the southwestern portion of the state,
16 from Keene up to Newport due north.

17 And the western region and the
18 northern region, particularly, are areas where
19 we're seeing significant amount of DER growth,
20 again leading to planning challenges.

21 As I go through planning, I will
22 emphasize that we plan for load and we plan for
23 DER using the same methods, the same tools.

1 They're two sides of the same coin, and so we
2 ensure that our facilities can accommodate the
3 load demand and the DER demands.

4 We -- the areas are further subdivided
5 into 13 area work centers and two satellite
6 centers, which support the regions with large
7 territories, and, therefore, commensurate longer
8 restoration times.

9 We have 123 substations across our
10 territory. Fifty of these are bulk distribution
11 substations. And I talk about these bulk
12 substations ad nauseam because they really are
13 the centerpiece of a lot of the planning that we
14 do.

15 The graphic to the right shows the
16 bulk distribution substations as blue circles
17 distributed across our territory. It's important
18 to note that the areas that tend to have more
19 load, more commercial activity, are areas where
20 there's a higher density of bulk distribution
21 substations, not surprisingly. And the areas
22 with lower load density, such as the north and
23 the western regions, tend to have less bulk

1 distribution substations.

2 The bulk distribution substations
3 serve an area of the territory, and they're
4 designed to serve the customers in that area.
5 And so if you have long distances between bulk
6 substations, you will have commensurately long
7 distribution feeders. Long feeders tend to equal
8 lower reliability. And that sets up some of the
9 planning challenges that we're seeing and that we
10 will discuss further.

11 Our system, at the distribution level,
12 is predominantly 34.5 kV and 12.47 kV. 34.5 kV
13 is the largest distribution voltage used in the
14 U.S. And because we have the distribution
15 backbone, most of the three-phase portion of the
16 system, as 34.5 kV, we can run longer
17 distribution feeders and ensure that when those
18 lines get to the customer location, the voltage
19 isn't lower than it should be. And so the
20 voltage regulation is assured by having a higher
21 voltage.

22 At higher voltage, we can also tie
23 into more power. And so longer feeders carry

1 more power longer distances with good voltage
2 regulation.

3 The drawback, again, is reliability.
4 Longer feeders, overhead, more exposure to trees,
5 to weather, to animals, and so that's a challenge
6 that we are constantly trying to address with our
7 design and with our operations, to ensure that
8 customers have good reliability, even with this
9 system design.

10 The graphic below shows the
11 distribution of 539,000 customer accounts across
12 the voltage levels. Again, because it's customer
13 accounts, it's not necessarily the number of
14 customers -- number of residents that we serve.
15 It's the accounts, commercial, residential, and
16 industrial. And, importantly, it does not
17 include the number of co-op customers or
18 municipalities that we serve. Those are seen as
19 one account. But, as you know, it's a number of
20 customers who need the same reliability and
21 resiliency.

22 Next slide, please, if there are no
23 questions.

1 So these 539,000 residential,
2 commercial, and industrial customers create
3 approximately 1.8 gigawatt, 1800 megawatts of
4 peak electrical demand. And this is the demand
5 that we have to plan for.

6 But when we plan for demand, we're not
7 planning for demand at the state level. It's
8 1.8 gigawatts at a state level, and as you drill
9 down into regional levels, and drill down even
10 further to substations, then you are revealing
11 the constraints of systems for the demand that
12 we're seeing in localized areas.

13 The 1.8 gigawatts is evenly
14 distributed across the regions. As you can see
15 in the load axis, peak load 223 megawatts, about
16 80 percent of the load is in the central,
17 eastern, and southern areas. The lower loaded
18 areas of the north and the west, because the load
19 is lower, they tend to have smaller substations
20 with smaller transformers, and, therefore, less
21 hosting capacity for DER.

22 And then the DER is mostly in these
23 areas. As you can see from the column -- the row

1 that says "Online DER" as a percent of peak load,
2 second to last row, the in-store DER right now is
3 64 percent of the load in the northern region and
4 40 percent of the load in the western region.

5 And this begins to manifest as a problem when we
6 have a low load period -- you know, a nice balmy
7 day in April or May, when air conditioners are
8 not running and it's a clear sky, and the DER is
9 producing like gangbusters. This is when you
10 begin to see reverse flow on these substations
11 flowing through the distribution transformer,
12 into the transmission system, and thermally
13 loading the distribution transformer, just as
14 forward load would. And so that's something we
15 have to plan for.

16 And spinning forward, the last row
17 shows that the DER that's in the queue, the ones
18 that are waiting to be started and connected
19 would load the northern and western regions to
20 129 percent and 139 percent of capacity.

21 CMSR. CHATTOPADHYAY: Just a follow-up
22 question.

23 In a previous slide -- or when you

1 were describing the other slides, you said, you
2 know, longer feeders, less reliability. Do you
3 have a reliability standard that you -- what is
4 your standard?

5 MR. FREEMAN: So we have a reliability
6 planning methodology, and we have standards --
7 and my colleague, Dr. Elli Ntakou, she manages
8 reliability and resiliency, so I'll ask her to
9 chime in if I misspeak anyway.

10 But we do have a reliability standard
11 in the way we design the system and upgrade the
12 system for reliability and the feeders that we
13 adjust for more reliability. And that standard
14 allows us to look at the feeders that have the
15 worst performing characteristics and adjust those
16 feeders. And we do tend to comply with any
17 targets that the state gives, as far as SAIDI and
18 SAIFI, and we design our system to ensure that,
19 at a circuit level, we are performing with
20 respect to SAIDI, System Average Interruption
21 Distribution Index, and SAIFI, System Average
22 Interruption Frequency, and that's basically the
23 duration and the frequency of outages. Our

1 standards are predicated on those two indices.

2 CMSR. CHATTOPADHYAY: Okay.

3 MR. FREEMAN: Next slide, please.

4 So this slide really encapsulates the
5 challenges that we face across all three states.
6 And I apologize for the small font, and I'll try
7 to illuminate some of the issues we are seeing in
8 each of those regions.

9 In the northern region of New
10 Hampshire, we have these long 34.5 kV feeders --

11 CHAIRMAN GOLDNER: Excuse me,
12 Mr. Freeman.

13 I have an idea, Attorney Chiavara.
14 Could you maybe send the presentations to the
15 clerks' offices. Maybe others are having a hard
16 time viewing it. I'm sort of having a hard time,
17 and I might be closer than many. It might be
18 good if the clerks can receive it and then send
19 it out as -- so everyone can see it from their
20 own PC.

21 I think we can proceed, but I think
22 that could be helpful as we go through the day.

23 MR. FREEMAN: Yeah. And what also

1 might be helpful, Commissioner Goldner, is saying
2 the Bates page, 02032. This figure is in the
3 DSP. Everything I'm presenting is in the DSP,
4 and if you have that up, we can --

5 CHAIRMAN GOLDNER: And that was
6 actually a complaint that I wanted to register
7 today. In a lot of the Company's filings -- at
8 least in the ones that are presented today, the
9 -- what you filed with the Commission was in
10 black-and-white, so you can't -- the color
11 coding, particularly on bar tables, are not
12 readable. So I'm not sure how we should address
13 that, if you have any ideas, but a
14 black-and-white filing in a lot of the cases for
15 the charts make them illegible.

16 CMSR. CHATTOPADHYAY: And then the
17 Bates page, I can't see it from here.

18 CHAIRMAN GOLDNER: So I think we can
19 move forward, but I think if we -- if we can send
20 that over to the clerks, Attorney Chiavara, that
21 would be very helpful.

22 MS. CHIAVARA: Yes.

23 MR. FREEMAN: So this is on Bates page

1 02032, and it presents the fact that there are
2 several different challenges across our service
3 territory. But in localized areas, these
4 challenges are even -- even more pronounced.

5 In the northern region -- think back
6 to the previous diagram, where we had the circles
7 on the chart. There are maybe three or four
8 substations in the northern region. There's -- I
9 think there's substations in Berlin, Whitefield.
10 These substations are far apart from each other,
11 and the distribution territory that they each
12 serve is tremendous. And so, by design, the
13 distribution feeders emanating from these feeders
14 are long. Typically, over ten miles long, as
15 many as 35 -- 35 miles long for the backbone.
16 And then the laterals that come off of that
17 backbone also have tremendous length. It's not
18 uncommon to see total distribution length of 70,
19 80 miles to a customer location. So that brings,
20 in itself, challenges.

21 So the lack, the sparsity of
22 substations, the sparsity of transmissions in
23 these areas, leads to distribution challenges

1 around reliability and resiliency that we're
2 trying to address in northern regions for
3 customers that may have historically been at a
4 disadvantage, and so we need to ameliorate that.

5 Going clockwise, the western region,
6 another region that tends to have long, 34.5 kV
7 feeders due, again, to the sparsity of
8 distribution substations, and, again, challenged
9 by reliability. These two regions are also
10 challenged by DER growth, because there's lots of
11 available land. Developers are building projects
12 in these areas. We have to connect these
13 projects into substations that are historically
14 small, lack of force and capacity.

15 And so we're dealing with challenges
16 of reliability and DER integration, which, again,
17 creates thermal constraints to our system. If
18 they're not addressed, could cause a shortage of
19 some to fail and affect all customers. And so
20 we're dealing with that as a challenge in the
21 north and the west.

22 Moving to the Manchester area. It's
23 an urban/suburban region, with a high utilization

1 of existing distribution capacity. And so we're
2 seeing step loads -- and step load are large
3 loads, such as commercial buildings, that may be
4 500 kilowatts, a megawatt and above. And so when
5 these loads are applying for interconnection --
6 for interconnection, and they have to connect
7 them to the system, they create constraints on
8 already heavily utilized equipment.

9 And so our challenge is to maintain
10 the reliability, the capacity of the system in
11 these areas, while accommodating these loads
12 which are so critical for the commercial activity
13 in the state.

14 The Nashua area, it sees a steady
15 development form of commercial and industrial
16 properties into new commercial and residential.
17 So we're seeing somewhat of an evolution in the
18 way these buildings are being used and some
19 intensification of the use, and, again, that's
20 driving some of the upgrades that we're seeing.

21 And then, finally, the Portsmouth and
22 seacoast region, in the fastest-growing region in
23 the East, have seen population migration over the

1 last couple of decades move up to the seacoast
2 and into Portsmouth and Dover and the Rochester
3 area. And we're seeing some of the -- the
4 activity create congestion and saturation in
5 areas.

6 For example, the Dover area, where
7 we're building a substation because we are seeing
8 constraints on the existing equipment, and we are
9 taking a two-transformer substation and we are
10 transforming -- upgrading it to 62.5, creating a
11 ring bus on the transmission to ensure that the
12 transmission line doesn't take the entire
13 substation down, and putting -- and we're putting
14 a double bus on the distribution side, all in an
15 attempt to create a reliable substation to ensure
16 that these critical loads remain served.

17 And, for example, Cutts Street
18 substation transformer, based on our forecast,
19 which I'll get to in a moment, Cutts Street will
20 be 140 percent loaded by 2032. It will be over
21 100 percent way before that. And so that's a
22 project that we see a need to upgrade the
23 substation to accommodate fast-growing loads,

1 loads in the Portsmouth area.

2 So it's an example of when you look at
3 the state and you begin to go down to subregions
4 and down to substation territories, the
5 constraints -- the violations become more
6 pronounced, because -- I will say this a couple
7 of times -- distribution is local.

8 When you begin to look at distribution
9 planning activities, you have to look at a
10 localized level, and you have to solve local
11 problems. I can't solve a problem in Nashua by
12 building capacity in Manchester. It needs to be
13 a Nashua solution. And that, again, is one of
14 the challenges that we face.

15 CHAIRMAN GOLDNER: If I can just jump
16 in. You mentioned, I think, that most of the
17 development, from a developer perspective, was
18 from the western region; did I understand that --

19 MR. FREEMAN: Yes, sir. The western
20 and the northern region.

21 CHAIRMAN GOLDNER: Western and
22 northern. Is that helpful to the Company, or is
23 that -- is that development in the right area to

1 help your situation, or is that unhelpful?

2 MR. FREEMAN: It's a good question.

3 We don't look at this as helpful or unhelpful,
4 because it's -- it's customers trying to
5 integrate DER, and it's our duty to enable that.

6 Now, it's not the ideal location, from
7 a capacity standpoint, and so it means that those
8 customers often may have to pay to upgrade a
9 distribution line, or worse, to upgrade a
10 distribution transformer for us to accommodate
11 them.

12 CHAIRMAN GOLDNER: And can you walk us
13 through that work? So you touched on it a little
14 bit last week, but it would be helpful for the
15 Commission to understand that process.

16 So if a solar developer puts solar
17 right next to a substation, it's in the perfect
18 spot, that's one thing. If they put it in a way
19 that's more challenging for the Company to
20 integrate, that's another.

21 Can you just walk us through the
22 Company's process and how it deals with maybe
23 those two scenarios?

1 MR. FREEMAN: Sure. So when we study
2 the solar impact on the system, it's studied from
3 two perspectives. It's studied on the impact on
4 the distribution feeder, the lines that go from
5 the substation that serves customers, and the
6 impact on the distribution substation itself.

7 And, you're correct, if the DER is
8 close to the distribution substation, there is
9 not a heavy impact on the line, because it's
10 right there. There may be an impact on the
11 distribution transformer on those clear, balmy
12 April middays that I mentioned, when there's high
13 output and very low load, that will reverse flow,
14 may load the transformer beyond its capacity, and
15 then we may have to upgrade the transformer in
16 anticipation of that. And so that's one
17 challenge.

18 The challenge on the distribution line
19 occurs when the DER is out long distance from the
20 substation, maybe on the end of a very long line.
21 And in that case, the system on -- is weak, and a
22 weak system means that any fluctuation in voltage
23 impacts everyone on that line.

1 So when the DER output is varying due
2 to cloud cover, every customer on that line may
3 see the voltage also fluctuate. So we need to
4 design the system so that distribution customers
5 are not impacted by the DER. And so we would
6 study the voltage impacts and ensure that we are
7 maybe re-conducting the line to a higher, larger
8 conductor, such that there's no fluctuation. And
9 we also ensure that the DER doesn't impact the
10 capacitors and the regulators that are out there
11 to regulate voltage.

12 CHAIRMAN GOLDNER: So what does that
13 look like from a developer's point of view? I'm
14 Developer A, and I'm putting it right next to
15 Substation A. I pay X. I'm Developer B. I'm
16 far, far away from the substation, and -- like,
17 how does -- how does the Company deal with the
18 cost difference of implementing those two
19 systems? What's the analysis from a developer
20 point of view when you're talking to them about
21 how much it will cost them, the developer, to put
22 their energy on the system?

23 MR. FREEMAN: Yeah. So we do what's

1 called a System Impact Study, an SIS. And the
2 System Impact Study analyzes all of the issues I
3 just mentioned, and others, to ensure that the
4 performance of the distribution feeder is within
5 our standards.

6 And then we identify what solutions
7 are needed for each DER. So we study each one
8 individually, almost sequential, right, on the
9 cost-causation principle. Which mean that, if
10 you caused a violation, then you need to fix it.

11 And so every DER is studied, and the
12 cost to mitigate the issues caused by the DER are
13 borne by the developer. So if the DER, at the
14 substation, causes an overload of the
15 transformer, that developer will pay the cost to
16 replace the transformer.

17 If the DER at the end of the line
18 causes overvoltage or voltage fluctuation, and we
19 have to upgrade that entire line all the way
20 down, that developer pays for the upgrade costs.

21 CHAIRMAN GOLDNER: That's very
22 helpful. And is there -- would you happen to
23 have now, or maybe later this morning if it's not

1 immediately available, maybe a couple of
2 examples? In the last couple of years, what's
3 sort of the minimum cost to a developer and the
4 Company and a maximum cost to a developer and the
5 Company? It'd be helpful for the Commission to
6 understand what we're talking about in terms of
7 dollars.

8 MR. FREEMAN: Certainly. I will have
9 that for you after the break.

10 CHAIRMAN GOLDNER: Thank you.

11 CMSR. CHATTOPADHYAY: Also, this is
12 out of just simple curiosity. Why do you think
13 it's that, you know, DERs are -- the requests are
14 coming mostly from the north and the western
15 regions?

16 MR. FREEMAN: Available land. It's
17 available land and the ability to get those
18 permitted by the municipalities.

19 CMSR. CHATTOPADHYAY: So you're
20 talking about not just solar rooftop, you're
21 talking about other kinds of PVs?

22 MR. FREEMAN: That's -- that's a great
23 clarification.

1 So when I'm talking about System
2 Impact Studies and impacts on the distributive
3 feeder, I'm talking about the front-of-the-meter,
4 ground-mounted DER.

5 The rooftop solar generally doesn't
6 create issues for us. Those are quickly and
7 easily connected. They only present themselves
8 as an issue in the aggregate, when there's so
9 much of them that we have to look at the voltage
10 issues. And so, typically, we see those mainly
11 connected in the east and the south and the
12 central regions on the rooftops, but there are
13 only so many of these that can be connected. The
14 vast majority of the DER in the north and the
15 west are these large solar farms that tend to
16 create issues on the distribution system.

17 CHAIRMAN GOLDNER: Would you mind
18 going back to that previous slide quickly?

19 So the -- you said that, because of
20 the land availability, the west and the north is
21 where most of the solar is going in place. And
22 that -- it's hard to see from here. It looks
23 like that alliance with the north and the west,

1 so that's where you also need the energy; is that
2 how to read that slide?

3 MR. FREEMAN: No. Actually, it's the
4 opposite. So the energy is needed in the east,
5 south, and central, right?

6 CHAIRMAN GOLDNER: Yeah. So --
7 perfect, so -- so it's not coming in the right
8 zone.

9 And then the other thing I'll mention
10 is that my recollection of the solar irradiation
11 maps is that, in New Hampshire, the southeast
12 corner of the state gets a reasonable -- or let's
13 just say, it gets an amount of solar radiation
14 that's greater than in the northwest part of the
15 state.

16 MR. FREEMAN: Yes.

17 CHAIRMAN GOLDNER: And so the solar is
18 going in, as a practical matter, far away from
19 your substations, and in an area of lowest
20 radiation, so it -- it seems like this is not --
21 what's your assessment of that? It seems like
22 it's going in in the wrong places.

23 MR. FREEMAN: So we've seen that solar

1 radiancy is not the driver for location of the --

2 CHAIRMAN GOLDNER: And why is that?

3 MR. FREEMAN: For example,

4 Massachusetts has more DER than most states
5 across the union, and has relatively low
6 irradiance and insulation compared to states in
7 the south. And a lot of it is driven by -- just
8 by policy. And developers will tend to react to
9 policy and develop projects, and size the
10 projects -- so if there's available land, even if
11 you don't have irradiance, you can size the
12 project such that you get the output that you
13 need to make your business case, right? You can
14 oversize the panels, and you can -- you can get
15 more energy out of the system if you're located
16 in certain areas.

17 And my -- Dr. -- my colleague,
18 Dr. Walker, wants to chime in. But before he
19 does, let me address the part that -- of your
20 question that states, are they locating in the
21 right areas to offset some of the load, right,
22 which is an important planning question.

23 If we are not depending on the DER --

1 and I'll emphasize a little bit more. We are
2 depending on the DER across the state to serve
3 the load and to offset the capacity that we are
4 providing for customers. And that's because we
5 have no control over the DER. We have no
6 operational control. They're owned by
7 developers, and they can produce or not produce
8 or play in the ISO market -- whatever they see
9 fit, right?

10 And so we have to design the system
11 with the kernel in mind that this power might not
12 be there when it's needed. And we need to
13 provide the capacity, and we need to account for
14 the load that will be there when the DER doesn't
15 show up. And so one of the guiding principles of
16 planning is that we're planning for the gross
17 load, not the net load.

18 If you back out the DER and back out
19 all of the other things that tend to mask the
20 load, let's plan for that. Because, at some
21 point, that will show up. And when it shows up,
22 things will break. So let's ensure that we're
23 planning for that worst case.

1 So I'll let my colleague now chime in.

2 DR. WALKER: Mr. Freeman already
3 covered most of it. I just wanted to answer to
4 that point with the radiancy. The panels are one
5 of the cheapest parts of that solar installation
6 compared to the interconnection across the land,
7 the permitting process. So just putting a little
8 bit more panels to get the same output,
9 typically, does not impact the finances of those
10 projects, so that can be compensated just by more
11 panels.

12 CHAIRMAN GOLDNER: So just -- just to
13 help the Commission understand the proportion.
14 If you are putting solar panel in Phoenix versus
15 the North Country in New Hampshire, how much more
16 area do you need?

17 DR. WALKER: That's a good question.
18 I don't have a good answer for you. I can go
19 get -- if you want actual numbers, give me 30
20 minutes. We can figure that out.

21 There's going to be a difference. But
22 also note that solar panels do not get more
23 efficient in hot temperatures. And so they do

1 lose efficiency the warmer it gets. So I
2 wouldn't be surprised if the difference isn't as
3 astonishing as you would expect.

4 CHAIRMAN GOLDNER: Yeah, because if
5 you just looked at the solar irradiation, you
6 would expect maybe a 3X difference. And what
7 you're suggesting is, because of the heat making
8 the solar panels less efficient, maybe it's more
9 like 2X or something like that. So it's not
10 proportional for the solar irradiation.

11 DR. WALKER: Give me five minutes.
12 I'll get you a number.

13 CHAIRMAN GOLDNER: Very good. And the
14 area issue, I think, is one just of covering up
15 land, right? So you'd have farmland. You'd
16 have, you know, land that's being used for
17 different purposes, and you're covering it with
18 the solar panels. So the more area you take up,
19 the less farmland and other sort of, you know,
20 useful area that you have.

21 So that's, I think, the way that at
22 least I think of it. If the Company thinks of it
23 differently, I'm just trying to understand the

1 Company's point of view.

2 MR. FREEMAN: No, that is true. You
3 know, there's -- there's a significant amount of
4 area that needs to be covered to get to the
5 energy -- the power that it needs for the solar
6 output.

7 CHAIRMAN GOLDNER: And just while
8 we're looking at the calculations, just so the
9 Commission can have a rule of thumb to understand
10 at a high level what's going on. If you're
11 putting solar panels in the North Country or
12 anywhere in New Hampshire, but let's just use the
13 North Country because that sounds like that's a
14 lot of what's happening, how much area do you
15 need per megawatt?

16 DR. WALKER: That's -- that's highly
17 dependent on some local factors, but I think a
18 good gauge, and subject to check, it's somewhere
19 between four and six acres a megawatt.

20 CHAIRMAN GOLDNER: Thank you.

21 All right. Thank you, Mr. Freeman.
22 You can turn to the next slide.

23 I think, Dr. Walker, while Mr. --

1 DR. WALKER: I have a number for you.

2 CHAIRMAN GOLDNER: Okay.

3 DR. WALKER: So this is directly cited
4 from the National Renewable Energy Laboratory.
5 So they're -- they say that in Arizona, you can
6 expect roughly 6 kilowatt hours per square meter
7 a day. And in -- most of New Hampshire being
8 roughly the same, about 4 kilowatt hours. So
9 there's a factor of 1.5.

10 CHAIRMAN GOLDNER: Okay. So 50
11 percent more efficient than the other region,
12 which is much less than you would expect from the
13 solar irradiation maps.

14 DR. WALKER: Yes.

15 CHAIRMAN GOLDNER: Okay. That's very
16 helpful.

17 And so just to kind of -- a direct
18 comparison would be, if you wanted to put in a
19 5 megawatt wind turbine, which is, I think, the
20 current standard size, if I recall, for
21 land-based wind turbines, versus a solar, in the
22 North Country, it would be -- you'd need roughly
23 25 acres in the North Country for a single 5

1 megawatt wind turbine. That would be apples to
2 apples, I think. So I'm just trying to
3 understand the differences between the different
4 technologies.

5 Okay. Thank you.

6 CMSR. CHATTOPADHYAY: Just a quick
7 follow-up?

8 MR. FREEMAN: Sure.

9 CMSR. CHATTOPADHYAY: When you're
10 talking about North Country, most of the DERs,
11 are they wind, or are you still talking solar?

12 MR. FREEMAN: Most of the DERs that
13 are in the queue, it's overwhelmingly solar.

14 CMSR. CHATTOPADHYAY: Okay.

15 MR. FREEMAN: But there's a
16 significant install of biomass, hydro, all the
17 types of DER, wind, that's there. But it's over
18 90 percent solar, now, in the queue, and battery
19 storage.

20 And just to emphasize a point that
21 Commissioner Goldner made earlier about the
22 location of these DER being in the north and the
23 west; whereas, the load to be served is in other

1 areas. That really signifies to us a need for
2 infrastructure to move the DER, particularly
3 transmission infrastructure. Because, as I
4 mentioned, that reverse flow is going up into the
5 transmission system, and if you don't have those
6 transmission lines to move that DER now -- DER
7 generation to the east and to the south and the
8 central regions, then we're doing ourselves a
9 disservice.

10 Other point to note, with regard to
11 DER build-out, and, again, there's about 700
12 megawatts in the queue that's coming. But, as we
13 look at our systems and the evolution of our
14 systems, across all territories that we serve --
15 in Massachusetts, for example -- and I don't want
16 to -- Massachusetts is an example, right? If we
17 are -- we are seeing, because of the EV heat
18 pumps electrification driving in those states,
19 they will be switching to winter peaking around
20 2035. A winter peaking system, the DER is not
21 going to help you to offset the load. You really
22 need to build a system to accommodate that.

23 Currently, in New Hampshire, I think

1 the fuse is little -- is longer. But, at some
2 point, we expect all of the systems to move
3 towards winter peaking. So we need to really
4 take a good look at the ability of DER to offset
5 that demand onto that paradigm.

6 Switching now to the ten-year load
7 forecast, which is on Bates page 02120 to 02121
8 of the DSP. At a statewide level, the load
9 forecast looks uninteresting, right? That's the
10 first -- the top right chart. It looks flat,
11 maybe even looks declining in some areas. So
12 full transparency, we have to start with that.

13 That's what it looks like at the state
14 level, but even though the load may appear flat
15 or negative at an aggregate level, as I said
16 before and continue saying, at the localized
17 levels, when you drill down into the system --
18 and distribution is all local -- you begin to
19 expose some of the violations and the constraints
20 that we have to deal with from a planning
21 perspective.

22 At a regional level, even -- and
23 that's the bottom left chart -- the step load

1 additions show a great disparity. In the eastern
2 region, there's a significant demand of step
3 loads compared to the other regions.

4 And so step loads alone will drive
5 almost 50 megawatts of increase, from 2024 to
6 2033. Fifty megawatts in the New Hampshire
7 system, that's a significant amount. That's
8 several substations' worth of load increase.
9 And, again, drivers are the development of
10 Portsmouth -- Portsmouth downtown in our
11 district, for which we have a plan for a
12 substation upgrade to address that.

13 We also -- we see EV, electrical
14 vehicle demand, as the second larger step load
15 driver. Looking at about 12 megawatts of
16 residential charging, mostly in the east and the
17 south.

18 And so these are some of the online
19 factors driving load increase in these regions.
20 From a step load perspective, it's important to
21 note that when we look at step loads, we look at
22 step loads that are certain, the ones that we
23 have a load letter from the developer that say

1 what they're building, how much, where. It's
2 going to happen. There's a work order that's
3 being written for that.

4 We're also tracking the step loads
5 that are probable, that are possible, that may be
6 out in the future. But we're not planning for
7 those yet, because there's some uncertainty, and
8 it would be irresponsible of us to begin to build
9 infrastructure for load that's possible or
10 probable.

11 And so we track that, and we look at
12 our lead time, which I'll talk about in a little
13 bit, to ensure that we are given -- we have
14 enough time to develop the infrastructure if that
15 step load becomes certain. And so when we look
16 at this yellow chart for the eastern region, you
17 see it goes up to about 32, 33 megawatts, and
18 then it flattens after a couple of years. And
19 that's because, beyond 2027, we don't have any
20 certain step loads in the east. We know about
21 things that might happen. We have some
22 indications of what customers are doing, but
23 they're not -- they haven't progressed to the

1 point yet where we will include them in our
2 forecast and plan for them.

3 But as time goes on, in a moving
4 window fashion, we begin to look at those loads,
5 and when they become certain, we plan for those.
6 Okay.

7 CMSR. CHATTOPADHYAY: Can I quickly
8 ask, for the eastern region, the step loads --
9 step loads of 2025 through 2027, what is it
10 about?

11 DR. WALKER: I can get that
12 information to you precisely, noting that this
13 will be high-level information, because we can't
14 really divulge individual customer projects.

15 CMSR. CHATTOPADHYAY: Understood.

16 DR. WALKER: But within -- before
17 lunch break, we'll have for you what's behind
18 that. Whether we're looking at industrial,
19 biotech, anything commercial based, we can get
20 that split.

21 CMSR. CHATTOPADHYAY: Thank you.

22 CHAIRMAN GOLDNER: And just, maybe an
23 opportune time to ask this question. So if

1 there's 700 megawatts in the queue and lots of
2 energy coming onto the grid, why would the
3 Company need any Company-owned solar?

4 MR. FREEMAN: So maybe this is a good
5 time to switch to the next chart, because the
6 next chart shows, really, the progression of
7 solar.

8 And so this is the growth in solar
9 over the last two decades, Commissioner. And you
10 see that over the last two years, we have seen an
11 exponential growth of solar. Other things to
12 note is that it's mostly small solar. The red --
13 the blue bars are everything that's less than 100
14 kilowatts, so it's mostly rooftop solar installed
15 by residential customers for their own purposes
16 to offset their loads. Like, I have 12 kilowatts
17 on my rooftop. It reduces my electric bill.
18 Okay?

19 Then there's some large ground-mounted
20 installations that we have to study. 500
21 megawatts, about, is installed and 731 megawatts
22 in the queue. These projects, again,
23 developer-owned projects, none of them are owned

1 by the Company. All of them are installed by the
2 developer to reduce energy cost to derive revenue
3 somehow from market programs. And they're
4 operated with that in mind. They're not operated
5 to reduce constraints on the Company's equipment.
6 They're not operated to reduce the load that the
7 Company has seen in particular distribution
8 substations. And because we have no operational
9 control over these, we cannot use them as
10 distribution assets. And so, in my planning, I
11 will discount those, for the most part.

12 Now, if there's a Company-owned solar
13 farm that's on the Company's operational control,
14 we can dispatch that generation to -- to reduce
15 loading on, let's say, a substation, and that
16 becomes for us a non-wired alternative. We have
17 heard the term. For us, that's the
18 differentiation between a non-wired alternative
19 and just solar and DER, whether we have
20 operational control and whether we can dispatch
21 it to resolve a need that we have that we would
22 otherwise build infrastructure to solve.

23 CHAIRMAN GOLDNER: And how does that

1 work for solar? I don't -- so the sun is
2 shining. You have available energy. You can, I
3 suppose, dispatch it in certain parts of the day
4 that would be helpful. Obviously, at night or
5 what have you, then it wouldn't be so helpful.
6 So how does it work for the Company? I guess, I
7 don't understand, when you say it's dispatchable,
8 in a solar array, how does that work? I don't
9 understand.

10 DR. WALKER: I can go quickly, just
11 piggyback on the topic of non-wired alternative.
12 So, as Mr. Freeman has already mentioned, in
13 order for us to use any DER, not just solar, but
14 call it storage and what else you have on the
15 system as a non-wired alternative, the Company
16 would need to dispatch it.

17 For a standalone solar, like, that's
18 hard to do, because solar just produces as it
19 does when the sun shines. And there, of course,
20 are certain curtailment options that we would use
21 to avoid constraints on the peak day. But, in
22 most cases, that would be paired with storage.
23 So you would pair solar and storage and utilize

1 those two in a combined fashion, as a non-wired
2 alternative.

3 CHAIRMAN GOLDNER: Okay. And when we
4 get to the part of the Company's presentation or
5 discussion on Company-owned solar, it sounds like
6 that typically comes with storage?

7 DR. WALKER: I'd have to defer --

8 MR. BELDEN: Pardon me. Andrew
9 Belden, Vice President for Solar Programs for
10 Eversource. Our team is responsible for the
11 development activities of our solar projects, as
12 well as operation and maintenance of the solar
13 projects that we currently own in Massachusetts.

14 I think, to your question about
15 Company-owned solar and the potential value of
16 that compared to privately owned solar, a couple
17 of factors, you know, weigh on our decision to
18 move forward with a project, which to -- to be
19 clear, we are not proposing specific projects as
20 part of this docket. We would, you know, very
21 much focus on developing a project and then
22 coming to you with that project in a separate
23 docket, very similar to how Unitil approached

1 their project.

2 But in terms of the value that we can
3 provide, a couple of things. With the Inflation
4 Reduction Act, there are new tax incentives or
5 new structures for tax incentives that will allow
6 utilities to take advantage of several benefits
7 that we could then provide to the ratepayers.

8 Also, the land that we own, much of
9 that is adjacent to substations, which means we
10 can develop projects at a lower cost,
11 potentially, than private developers who may not
12 be similarly situated.

13 And then, you know, finally, laws
14 currently in New Hampshire put upper limits on
15 the size of distributed solar owned by other
16 entities. Whereas, we're, under RSA 374-G,
17 provided the opportunity to build larger
18 projects, which may be more cost effective than
19 privately owned projects.

20 CHAIRMAN GOLDNER: 374-G caps the
21 Company at 5 megawatts; is that right?

22 MR. BELDEN: That's correct.

23 CHAIRMAN GOLDNER: Maybe we can pause

1 here and have a brief solar discussion. So if --
2 if there's -- how does the work -- how does the
3 5 megawatt limit work? If you have some 40 acres
4 east of the substation and you build 5 megawatts,
5 and you have 70 acres north of the substation,
6 are those two separate 5 megawatt arrays, or how
7 does -- how do those rules work?

8 MR. BELDEN: So we had different --
9 the 374-G rules state per interconnection. So,
10 ultimately, we would be limited by the
11 interconnection process to one 5 megawatt project
12 AC. But what we can also do is upsize the
13 project, so the DC scale might be 7 megawatts;
14 whereas, the AC might only be 5 megawatts.

15 CHAIRMAN GOLDNER: Does that mean you
16 can only put one 5 megawatt station or 7 megawatt
17 station per substation, or how -- when you say
18 "interconnection," what are the limits on
19 interconnection?

20 MR. BELDEN: Yeah, so it would be
21 individual point of interconnection on the
22 system. And I think -- not to get too far ahead
23 of ourselves, but I think we consider a project

1 an individual point of interconnection on a
2 single parcel of land.

3 CHAIRMAN GOLDNER: Okay. Okay. So
4 it's really -- per parcel up to 5 megawatts is
5 kind of the way the Company thinks of it. Okay.
6 That's very helpful. Very good.

7 CMSR. CHATTOPADHYAY: But -- but there
8 is no -- there's no legal impediment to sort of
9 going with two different projects and -- you
10 know, that are in the same plot.

11 MR. BELDEN: I would have to really
12 consult attorneys on that, but I think our
13 current perspective on it is an individual
14 project would be one point of interconnection on
15 one parcel of land.

16 CMSR. CHATTOPADHYAY: Thank you.

17 CHAIRMAN GOLDNER: Mr. Freeman?

18 MR. FREEMAN: So let's spin forward
19 two slides. So I will get into our planning
20 methodology, and I'll try to speed this up. I
21 don't know if we --

22 CHAIRMAN GOLDNER: Take your time.

23 MR. FREEMAN: You may be sorry you

1 said that.

2 So I'm going to start with a
3 high-level view of the electric grid. And it's
4 just -- the grid really has three components, we
5 know: generation, transmission, and distribution.
6 And utility scale generation is interconnection
7 across almost -- is across all New England,
8 really. These are high-voltage power lines, and
9 all these lines are networked together to create
10 pretty much -- pretty much a superhighway that
11 moves electricity from the power plant to
12 electric substations.

13 Most notably, this is really a
14 different paradigm than the distribution system.
15 If you have a power plant in one part of New
16 England that is decommissioned or that fails to
17 produce, power plants in other portions of the
18 system can pick up the slack. They're fungible.
19 They're replaceable. On the distribution system,
20 it's all local. There's no such thing as
21 fungible in distribution.

22 And so when we build capacity in a
23 particular part of the system, it had better

1 perform, because if it doesn't, then customers
2 may be out of power. So that will color the way
3 we look at infrastructure and the way we look at
4 non-wired alternatives and the standard that we
5 hold them to, that performance standard, because
6 assets are not fungible.

7 The distribution system is the
8 backbone of a reliable electric power system that
9 serves -- that is the interface between
10 transmission systems and our customers. And
11 whenever our customers feel pain, to the extent
12 that they do, it can be tied back, in most cases,
13 to the distribution system and to the design and
14 operation of the distribution system, which is
15 why we put so much focus on planning for that, or
16 at least I do, because that's my role.

17 Next slide, please.

18 And if the distribution system is the
19 backbone of a reliable electric power system,
20 then the bulk distribution substation is a
21 critical element of the electric power
22 distribution system. And, again, those are those
23 circles on that second slide that I showed.

1 And these bulk substations have
2 several components. The transmission lines
3 coming in, typically, they're 115 kV. We do have
4 a couple that are served at 345, but it's really
5 an exception. Most of our substations have 115
6 kV lines as source. And then distribution lines
7 go out at 34.5 mostly. And they transition out
8 via what's called a getaway. There's an
9 underground section that goes out on a fence and
10 then it transitions to overhead.

11 The top of the feeder is serviced by
12 the breaker, typically. And this breaker is the
13 protection element for that feeder. Whenever
14 anything happens on that feeder, such as a
15 fault -- fault current flows, that breaker is the
16 last resort to ensure that that full current is
17 interrupted on the distribution feeder. It's a
18 really critical part of the design.

19 The protection and control room is the
20 brains of the substation, in terms of the
21 protection and the devices that switch and
22 operate the substation. That, again -- the
23 step-down transformer is the workhorse of the

1 distribution substation. And these are the
2 elements that are typically thermally constrained
3 with regard to flow, either in the forward
4 direction for load or the reverse direction for
5 DER.

6 So we're really focused on assuring
7 that our distribution power transformers are
8 sized appropriately for the demand that we will
9 see over the next ten years, not just tomorrow,
10 not just next year, but forecasting for the next
11 ten years, and ensuring that they can serve the
12 demand that we're projecting.

13 Next slide, please.

14 So a significant portion of our
15 planned activities at the power station level are
16 driven by the performance of the substation. It
17 really sets the stage for performance at all
18 levels, and our ability to upgrade these systems
19 are really a function of the lead time. It's why
20 we plan. If we had a magic wand that we could
21 wave, presto, and a substation shows up tomorrow,
22 I would be out of a job. We wouldn't need a
23 planner, right? But we need a planner, because

1 it takes time to put that action into service.
2 On the transmission level, it takes about
3 ten-plus years to build transmission. Bulk
4 substations, five-plus years. Again, that's the
5 workhorse, so you're looking five years into the
6 future to understand the needs for those.

7 Even primary feeders, either the 12 kV
8 or the 34 kV level, it takes two to four years to
9 build that primary feeder. And the lateral,
10 which are typically single phase off of that
11 backbone, you would think, quick? No, one to
12 three years. Everything takes time. Even
13 secondaries and services. On the secondary side
14 of the service transformer that goes to
15 customers' premises, it takes a couple of months
16 up to a year to get those into service.

17 So effective planning are cause for
18 this lead time to deploy transmission
19 distribution assets in developing reasonable
20 alternatives. And I would add, in developing
21 reasonable alternatives in an orderly manner.
22 And that's the key. Because if it's not orderly,
23 if you're reacting, if it's chaos, it's

1 expensive. Chaos is expensive, right? Orderly
2 can be efficient. And so that's what we're
3 trying to do when we -- when we develop our
4 substations.

5 And I'll -- I'll talk a little bit
6 later about what some of the performance
7 requirements are, but -- so let's keep this in
8 mind and go to the next slide.

9 Oh, distribution planning process,
10 this orderly process that we're trying to -- to
11 substantiate really is a cyclical process that
12 happens every year. It starts with forecasting
13 the net load on the system. It's a very
14 important activity that my colleague, Dr. Walker,
15 is in charge of.

16 That forecasting starts after the
17 summer peak load, right? When the summer peak
18 load has happened, the engineers and planning get
19 together, and we begin to develop the peak system
20 load for that year, accounting for a number of
21 things. We may have had to transfer load from
22 one feeder to the other, and that we have to back
23 out and account for. We have to account for DER

1 that maybe masks a portion of the load. It
2 happened to be generating at the time, but what
3 if it wasn't? And that's a what-if question you
4 have to ask. What if it wasn't there, what would
5 the load have been? Because next year, it may
6 not be there.

7 And so we look at that. We look at
8 the impact of electric vehicles, impact of
9 electric efficiency, and we develop that peak
10 load at every single bulk substation, so it's
11 really granular.

12 And then that is given to Dr. Walker's
13 team, and then the forecasting people, and they
14 develop the long-range forecast over ten years at
15 every single bulk substation. So what the
16 planners get back from them is, for every year
17 for the next ten years, what is the load expected
18 to be -- what is the gross load expected to be,
19 weather adjusted, at every single bulk
20 substation.

21 And with that now, I can begin to use
22 my tools, and I can do analyses. And I can
23 impose that load on every substation, and I

1 impose that load on every feeder, and then I run
2 the analyses to figure out when a thing is going
3 to break, how badly is it going to break, and
4 when.

5 And now that tells me what solutions I
6 need to develop and where these solutions would
7 have to be developed. And this is a cycle that
8 we -- you know, so, typically, in the first
9 quarter, second quarter, we run these analyses
10 and we develop the future capacity needs; develop
11 cost-effective solutions probably in the second
12 to third quarter. These solutions take it
13 through our internal approval processes to
14 understand which ones have the most merit. And I
15 have a slide that will kind of illustrate that.

16 But this cyclic process is what really
17 drives the planning every year for our power
18 distribution substations. The overall guiding
19 principle, I'll just read that, "is to enable
20 disciplined, cost-effective build-out and
21 reinforcement and replacement of equipment and
22 facilities to meet future demand with acceptable
23 system performance."

1 And what is acceptable system
2 performance, you ask? Well, that's a good
3 question. So I will -- I'll answer that in a
4 slide or two, but just keep that in mind. Next
5 slide.

6 CHAIRMAN GOLDNER: And this is
7 something that the Company executives review
8 annually, you said?

9 MR. FREEMAN: So, annually, when we
10 develop the solutions, all these solutions are
11 taken to what's called our Solution Design
12 Committee. And this committee has directors and
13 managers across the entire state, and they look
14 at the solutions. And we typically bring, not
15 just a solution, but alternatives. One of these
16 alternatives includes a non-wired alternative
17 solution, if it's doable.

18 And they look at these solutions, and
19 they would decide which one has the highest
20 benefit for customers, which ones should be --
21 should move forward, and which ones may have some
22 opportunity to, for lack of a better word,
23 co-optimize with some other solution.

1 There are many other needs across the
2 system besides capacity, and there may be asset
3 condition needs, and so we look for opportunities
4 to do conjunctional projects to reduce costs for
5 our customers.

6 CHAIRMAN GOLDNER: And what's the
7 process for determining the best -- you mentioned
8 that there's -- there's multiple options
9 presented to the committee. What's -- what is
10 their process? What are they considering when
11 they decide which one is ultimately chosen?

12 MR. FREEMAN: So there are a couple of
13 things that are not negotiable. So each project
14 must meet the system need, right? And once --

15 CHAIRMAN GOLDNER: You wouldn't
16 present that anyway, if it didn't, right? So
17 that doesn't come in front of the --

18 MR. FREEMAN: It doesn't come in front
19 of the committee.

20 And then we present the cost. That's
21 a critical element. And most of the cost is
22 developed at a -- at a conceptual level. All
23 right?

1 And we look at the impact of the
2 solution in terms of reliability. And there's a
3 matrix that system engineers simply put together
4 for consideration. We look at pattern losses.
5 We look at environmental impacts; would one
6 solution have an environmental advantage over the
7 other. And there are a number of other -- other
8 attributes that we look at for each project, and
9 then each project is -- is ranked via these
10 attributes, and a score is developed.

11 And this is presented as one piece of
12 evidence before the committee, who will consider
13 other things in their review of the solutions,
14 such as, the ability to site the solutions and
15 things like that.

16 CHAIRMAN GOLDNER: So, ultimately, one
17 solution is chosen by the committee. It's built.
18 And then it comes before the Commission in a rate
19 proceeding, at some point, for prudence review;
20 is that fundamentally how the process works?

21 MR. FREEMAN: I will defer to my
22 colleague, but, to my understanding, that is how
23 the process works.

1 MR. COATES: Yes, with one caveat. In
2 that process, from the Solution Design Committee,
3 it then becomes a project -- gets -- goes through
4 a project authorization process. The executives
5 are reviewing and signing off on those processes,
6 and the outcome of the Solution Design Committee
7 is reviewed and understood.

8 And, as Mr. Freeman highlighted, we
9 look for those opportunities where we can solve
10 two problems with one solution. Maybe we're
11 solving Problem A for the capacity issue by also
12 working on an asset condition on that line,
13 etcetera. So we optimize the solutions. It goes
14 to executive review, and then they would be
15 executed and ultimately in the hands of the
16 Commission for prudency review.

17 CHAIRMAN GOLDNER: Thank you. That's
18 very helpful.

19 And my only follow-up, do the parties
20 ultimately, in the rate case, have visibility
21 into the options that were considered and what
22 was ultimately chosen and the thought process, or
23 do they really get the final answer, and then

1 that final answer is subject to the prudence
2 review?

3 MR. COATES: The project authorization
4 form captures all the solutions, the reason and
5 justification for the decision to build Project
6 X, Y, or Z.

7 CHAIRMAN GOLDNER: Okay. That's -- I
8 do remember that. Thank you. Thank you.

9 Mr. Freeman.

10 MR. FREEMAN: So the tools and methods
11 that we use for performance evaluation are shown
12 here. It just, my own point of showing this, is
13 that's it's complex.

14 There are a number of methodologies
15 and tools that we use across different time
16 scales and different levels of granularity. For
17 example, the steady-state thermal impacts. And a
18 steady state is when there are no forces on the
19 system, and the system is in equilibrium and
20 operating continuous.

21 And for that, we typically use tools
22 like Synergi. We used to use DistriView in New
23 Hampshire. On the transmission side, we use

1 TSSC. And we analyze the system to understand
2 the impact of forward and reverse flow on the
3 distribution transformers on line equipment,
4 overhead and underground distribution feeders and
5 whether they're exceeding their thermal limits
6 and their standards that we have both on the
7 trans -- the substation and the distribution line
8 side that dictate what is exceeding a thermal
9 limit; what does that mean?

10 CHAIRMAN GOLDNER: Are those like IEEE
11 limits, or are those Company-imposed limits?

12 MR. FREEMAN: Those are
13 Company-imposed limits. They're Company
14 standards. But they -- for things like voltage,
15 they are in line with IEEE standards and some of
16 those criteria.

17 CMSR. CHATTOPADHYAY: Can you tell me
18 what the Bates page is?

19 MR. FREEMAN: Oh, sorry. It's 02090.
20 I meant to say that.

21 CMSR. CHATTOPADHYAY: Thank you.

22 MR. FREEMAN: You're welcome.

23 Steady-state voltage impact, this is,

1 again, a result of load flow. We look at
2 distribution feeder violations, and again -- I
3 think in New Hampshire, it's plus/minus 5 percent
4 of nominal. So, typically, on the distribution,
5 we're looking for 114 to 126 volts at the
6 customer location. And if -- if we see that we
7 are violating that range, then we would plan
8 something to mitigate that. And that is affected
9 by the load during those peak times and affected
10 by DER during light load times in the reverse.

11 DER will cause overvoltage, which can
12 cause equipment issues, and load could cause
13 under-voltage, which, again, creates equipment
14 issues. And these are not as discernible as they
15 used to be, now that we don't use incandescent
16 bulbs anywhere, because you would see the dimming
17 of bulbs yourself. But now we see effects on
18 equipment, fans, compressors; any kind of thing
19 that has a motor could be affected by low
20 voltage. So we take a good, hard look at that.

21 We look at short-circuit impacts.
22 When a fault occurs, how much fault current is
23 flowing from the substation down the line, and

1 ensure that the equipment is sized to handle a
2 fault current, so it doesn't fail
3 catastrophically when it sees this amount of
4 current flowing, but also that flow current is
5 very important for us from a protection
6 standpoint. Because the fault current needs to
7 be sufficient to allow the protection equipment
8 to see it and to trip it offline. Because if you
9 don't see it, then it stays there and creates a
10 whole other problem.

11 So the systems are designed to ensure
12 that there is sufficient fault current so that
13 our protection systems work well, and so we can
14 take equipment out of service quickly that has
15 been faulted.

16 We do dynamic and transient analyses
17 to understand the state of the system during a
18 fault. When a fault has occurred, you typically
19 get high transient voltages, as much as 1.7 per
20 unit, 1.7 times the normal voltage, which, again,
21 can damage equipment.

22 So we analyze the system to understand
23 what is the risk of transient voltages and how to

1 design the system so that you don't get that.
2 And that typically happens with DER. When you
3 have a lot of DER on the line and you open the
4 breaker, the trap charge creates a lower voltage.
5 And that's an analysis that we conduct for every
6 single system in the study, to ensure that
7 they're not creating transient overvoltage and
8 that you're not incurring a risk of islanding,
9 which means you have DER on the feeder, you open
10 the feeder breaker, and the load at the DER is
11 matched, so that the island sustains itself, and
12 the DER continues to serve the load, in an
13 unintended fashion. Because we don't want that
14 to happen if we open the breaker. So we ensure
15 that any DER that's in an island will trip
16 offline in two seconds, and that island would
17 die, basically, and customers would be out of
18 power, which is what is intended if you open the
19 breaker.

20 So, again, for every DER, we conduct
21 that study, because it's a safety issue, and
22 that's paramount that we do that.

23 And then we look at the reliability

1 and resiliency impacts. And this is becoming a
2 larger part of our studies, doing databased
3 reliability and resiliency analysis to understand
4 the impact of past storms, how those storms have
5 resulted in customer interruption and customer
6 minutes of interruptions, and then designing
7 measures down to the zone level to mitigate those
8 impacts. And then -- and then -- and those
9 solutions become part of our plan. And in the
10 DSP, we included a resiliency plan that was based
11 on that analysis.

12 CMSR. CHATTOPADHYAY: Just correcting,
13 I think, Bates pages 02083.

14 MR. FREEMAN: Okay. I'll make a note
15 of that. Thank you, sir. Okay. We'll correct
16 that.

17 Next slide, please.

18 So with these advance tools and
19 processes and methodologies that we use, the
20 objective is to --

21 MR. DEXTER: Commissioner, I hate to
22 interrupt, but following up on Commissioner
23 Chattopadhyay, I'm having a hard time following

1 the Bates page numbers. So if the speaker could
2 announce the Bates page number when he says,
3 "next slide," that would be helpful. I can sort
4 of see them, but I'm having a hard time keeping
5 up.

6 MR. FREEMAN: This was Bates page
7 91 -- 09 --

8 DR. WALKER: '2091 --

9 MR. FREEMAN: -- to '2093.

10 DR. WALKER: Yeah, to '2093.

11 MR. DEXTER: So that's not showing up
12 on my 02091, '2, or '3. Well, I guess it is. On
13 that chart with the red and the blue is showing
14 up on 02093.

15 MR. FREEMAN: '93, and the text is on
16 02091.

17 MR. DEXTER: Thank you.

18 CHAIRMAN GOLDNER: Thank you, Attorney
19 Dexter. Let's do this. Let's take a brief
20 break. Attorney Chiavara, our clerks don't have
21 the presentation yet, so if you could make sure
22 that we take care of that on a break, and that
23 way, that will solve a lot of problems in terms

1 of identifying the Bates number and so forth.

2 But let's just take a brief 15-minute
3 break, returning at a quarter of. Thank you.
4 Off the record.

5 (Recess taken.)

6 CHAIRMAN GOLDNER: Back on the record
7 now, and we can start with the Company.

8 MR. FREEMAN: So my colleague,
9 Dr. Walker, actually has one of the data points
10 you asked for, Commissioner, so --

11 CHAIRMAN GOLDNER: Thank you.

12 DR. WALKER: All right. So the
13 question was on the step loads and what the
14 makeup is. So very roughly, in four categories,
15 we have commercial, industrial, residential, and
16 transportation related, so EV charging.

17 The commercial makes up about 84
18 percent of all projects and 62 percent of the
19 load. Industrial makes up 5 percent of the
20 projects and 26 percent of the load.
21 Residential, 5 percent of the projects and 2
22 percent of the step loads. And transportation,
23 7 percent of the projects and 10 percent of the

1 load.

2 I hope that answers the question.

3 CHAIRMAN GOLDNER: Thank you.

4 CMSR. CHATTOPADHYAY: Thank you.

5 MR. FREEMAN: And we're -- everything

6 -- we're getting the information from the DER

7 costs. I will have that for you probably after

8 lunch.

9 CHAIRMAN GOLDNER: Thank you.

10 MR. FREEMAN: So I have three more

11 slides, and I apologize, I think I was going a

12 little bit fast earlier. So I will slow down a

13 little bit, because this actually is the key

14 slide. Everything I have said before leads up to

15 that slide. And I wish it -- I had put a pin in

16 performance criteria, and so now I'm going to

17 expand a little bit on that.

18 Our planning objectives with regard to

19 the system performance are we provide adequate

20 reliability and resiliency to disrupted events.

21 And the way we do this is, as I said, by doing

22 detailed analysis at every distribution feeder to

23 understand two things: the frequency of

1 interruptions for customers and duration of
2 interruptions for each customer.

3 With those data points for each
4 customer, we can build that up into any kind of
5 indices or index in the industry. And you have
6 heard the term SAIDI, SAIFI, CAIDI. That's where
7 that comes from. And for most jurisdictions,
8 reliability is about 99.98 percent, and that
9 transmits to about two hours of interruption out
10 per year. That would -- that would probably be
11 second quartile, IEEE performance.

12 We assess our system to understand how
13 we line up against those benchmarks and how we
14 deliver, you know, reliability to our customers
15 and commensurate with the system design. As I
16 have mentioned before, there are certain
17 realities with respect to how the system is
18 designed and with respect to the exposure of long
19 lines. That means we are going to have issues.

20 And the way we address that is by
21 maintaining the system, by building in
22 distribution automation to be able to reconfigure
23 the system as much as we can, and by having

1 operational response to ensure that we can
2 dispatch those to repair and restore customers
3 once they're faulted.

4 All of this constitutes a response and
5 the ability to provide reliability and resiliency
6 during disrupted events. But, again, it starts
7 with planning the system and designing the system
8 to assure all those other elements can help us
9 to be responsive

10 We ensure that there's sufficient
11 capacity to meet future demands and service
12 needs, and the capacity constraints are exposed
13 when we do analysis with the future load
14 forecasts and understand what the constraints
15 are. And the capacity applies from the
16 distribution substation down to the lines.

17 At the transformer level, we ensure
18 that during normal operation, our transformers
19 are not loaded beyond a certain point. In New
20 Hampshire, we ensure that 95 percent of the
21 transformer capacity is used before we begin to
22 trigger replacement. Okay?

23 So we're pushing all transformers and

1 the utilization of the transformers as much as we
2 can. And just so you know, Commissioners, that's
3 beyond what other states are doing. It's 75
4 percent in Massachusetts and Connecticut. We
5 also ensure that on N minus 1, when the failure
6 of transformer occurs, that the remaining
7 transformer -- if there are two transformer
8 substations -- has sufficient capacity to pick
9 that up without being loaded beyond its long-term
10 emergency rating for more than a cycle.

11 And so if it's -- we need to ensure
12 there's ability to transfer load to adjacent
13 substations via the distribution feeders to bring
14 that transformer below its long-term emergency
15 rating. These ensure that these assets stay
16 viable, that they don't fail catastrophically,
17 and that we get the performance and the longevity
18 out of them commensurate with their design.

19 We also look at the distribution line
20 and ensure that the distribution overhead as well
21 as the conductors are not loaded beyond 80
22 percent -- if it's underground, 90 percent --
23 subject to check, if it's overhead. I will check

1 on that. And those criteria are put in place to
2 ensure -- actually -- is it 90? Okay. So I did
3 check.

4 So those criteria are put in place to
5 ensure that we have operational flexibility, that
6 if it -- if there's a failure on the distribution
7 feeder, we have sufficient capacity on other
8 feeders to pick up load. A big part of load
9 reliability and capacity assurance is the ability
10 to transfer load to other feeders.

11 And so we have standards of criteria
12 in place to ensure that we are not overloading
13 ourselves, but also to ensure that there's
14 sufficient capacity -- sufficient head room in
15 the assets to ensure reliability. If we run all
16 of our assets to the brink, if we -- if we load
17 everything up to 100 percent, when something
18 fails, customers are going to lose power, because
19 we have no ability -- we have no operational
20 flexibility. So we design our system to ensure
21 that we can make moves to keep customers
22 energized.

23 We also ensure that we satisfy all

1 voltage and power quality requirements within an
2 acceptable limit. I want to mention the ANSI
3 C84.1 standard, plus/minus 5 percent of the
4 nominal. We also look at the flicker that may be
5 imposed by DER, and ensure that that flicker does
6 not impact our customers.

7 And we would put capacitor banks,
8 voltage regulators out there. We put conductor
9 feeders to ensure that the voltage that customers
10 are seeing is compliant with the standards that
11 we expect to have. And then we ensure that we
12 serve all customers safely, wherever they exist.
13 And that is -- that is paramount.

14 There is another element to
15 performance, which is frequency. But frequency
16 is more upgrading a bulk power transmission
17 generation issue. The distribution system is
18 typically not configured to resolve frequency
19 issues.

20 The data analytics of tools that we
21 leverage involve traditional/nontraditional
22 sources. We have made a concerted effort to
23 become a data-driven company. We have -- we are

1 -- within planning, we have hired data
2 scientists, and we have built an advance planning
3 group that looks at how we can leverage data
4 sources to inform our planning decisions, sources
5 such as solar irradiance scanners, understanding
6 where solar irradiance is, understanding the
7 ability of the DER to produce output from the
8 flow and radiance information, and then being
9 able to account for that in our planning.

10 Using EV mobility data, looking at
11 vehicles and their travel patterns, maybe we
12 have -- you see travel patterns of vehicles
13 coming in from Massachusetts into ski resorts,
14 and if Massachusetts is electrifying, you bet EVs
15 are coming over.

16 And so we need to get ahead of the
17 curve and understand that these batteries on
18 wheels are going to be moving around and plugging
19 in and maybe creating constraints on our service
20 transformers, our distribution lines, and
21 potentially our substation transformers, and get
22 ahead of that and begin to plan for that
23 proactively with regard to lead time. And so we

1 use data to understand travel patterns and see
2 how those potential EVs could be disruptive to
3 our infrastructure.

4 We use GIS. We use parcel data to
5 understand the ability to develop DER. Where is
6 the developer land, and if that land is
7 developed, what does that impose on the
8 substation?

9 And so when we forecast solar, it's
10 based on the developer plan, and we have
11 databases that account for land that may not be
12 developed over where they -- you know, whether
13 it's park land, protected land, wetlands. But
14 the land that is developable, we forecast the
15 ability of DER to go into those areas and account
16 for that in our planning.

17 So we're really trying to -- to do
18 things from a data-centric and a defensible way,
19 so that when we make plans, we are developing the
20 right-sized solutions for the problems, and we're
21 putting the state in the best position possible
22 from a commercial development perspective as well
23 as from a reliability and resiliency perspective.

1 So taking a long-term view of the
2 system, when we develop solutions, we do it in a
3 structured manner. We start by looking at the
4 least-cost solutions first, and these would be,
5 for example, reconfiguring the system to balance
6 load. If you have a line that's overloaded, can
7 we move some of those customers to an adjacent
8 feeder and reduce the loading? That's a
9 relatively low-cost solution, partially phased
10 out in time. It's basically opening one tie and
11 just closing another. That costs us nothing.
12 And in the worst case, we may have to do some
13 distribution feeder upgrades. But that's where
14 it starts.

15 And then if that doesn't work, then we
16 look at replacing or upgrading the limiting
17 equipment, but only replacing and upgrading the
18 equipment that is impacted by the constraint.
19 Unless there is some other need. As Mr. Coates
20 said, we try to aggregate and do conjunctional
21 projects where it makes sense to resolve other
22 needs. And so if a wider reconductoring
23 technology is needed to resolve something else,

1 then we would do that. But we tend to try to
2 replace only the limiting equipment and constrain
3 to our own system to what's needed.

4 We would add new equipment or expand
5 the system capacity, so this could be expanding
6 the substation. You could add a new transformer,
7 add new lines, new feeders, add new capacitors,
8 voltage regulators, whatever it takes to resolve
9 capacity.

10 We construct or apply non-wired
11 solutions where it makes sense, and we've
12 discussed this. And there are some solutions
13 that are not -- there's some needs, sorry, that
14 are not suitable for non-wired alternatives, and
15 those are possible needs that -- where equipment
16 is aging, where this is a safety-related issue,
17 an asset condition issue, we would tend not to
18 suggest a non-wired alternative for that need.
19 But certainly, wherever it's suitable, for
20 capacity needs, for reliability needs, the
21 planning engineers would develop a non-wired
22 solution. And we have a tool that we've
23 developed, NWA screening tool, that looks at the

1 non-wired solution and compares it to the
2 traditional solution, and does a benefit/cost
3 analysis to ensure that the benefit of the
4 non-wired solution outweighs the cost of the
5 deferral of the traditional solution.

6 CMSR. CHATTOPADHYAY: Question.

7 Has Eversource -- regardless of where
8 it is, New Hampshire, Massachusetts or
9 Connecticut, have you constructed or applied
10 non-wired alternative solutions already?

11 MR. FREEMAN: We have. In
12 Massachusetts, we constructed a battery, a
13 21-megawatt -- 21-megawatt battery in
14 Provincetown, Massachusetts, to resolve a
15 reliability issue.

16 Customers on the end of a long line
17 would typically see outages, if that line were
18 interrupted, and so this battery was developed to
19 mitigate that situation, and --

20 CMSR. CHATTOPADHYAY: That's the only
21 one?

22 MR. FREEMAN: As far as I know, that's
23 the only one. However, we're in the process of

1 developing a couple others, and they're in the
2 internal project development stage right now.
3 One in Hyde Park. It will be a battery solution
4 to relieve a station that is currently
5 overloaded. Another one in an industrial park,
6 which would resolve power quality issues. So
7 those are two that are filed in our electric
8 modernization plan in Massachusetts, and the
9 information is there if you care to look at a
10 700-page document.

11 And we are also developing -- so we
12 have proposed several in Connecticut with PURA,
13 and right now, they're under consideration. And
14 those battery projects, again, are to relieve
15 substations that are projected to be overloaded.
16 Instead of upgrading the transformer, this
17 battery would allow us to push that project off
18 several years and create value for our customers.

19 DR. WALKER: I just wanted to mention
20 the Connecticut one as well.

21 MR. FREEMAN: Yeah. So one that's --
22 that has been completed, and it's in service. It
23 has functioned as it was designed to function

1 several times during events. And at least four
2 that are in development.

3 CMSR. CHATTOPADHYAY: Thank you.

4 MR. FREEMAN: You're welcome.

5 And, you know, when -- when it's --
6 when we see the need, we'll build a new
7 substation. And, again, there's a lot of
8 analysis behind that, and whether we do it or not
9 is subject to lots of internal checks. But that
10 is a solution in our portfolio, to build a new
11 substation. And oftentimes that is the right
12 thing to do. And if it's the right thing to do,
13 it's something that -- that I would be
14 comfortable in advocating for.

15 The solution selection is a complex
16 iterative process involving several groups in the
17 Company to selectively find a solution in
18 compliance with internal and external stakeholder
19 requirements.

20 I discussed this a little bit before,
21 but this -- Bates page 02091 to 02093 includes a
22 discussion and this diagram, which I admit is a
23 little bit small here, but scanning from the left

1 to right, the first block says the need is
2 identified.

3 And so for a typical capacity project,
4 a reliability project, that would be system
5 planning. For a line project, it could be
6 distribution engineering. For an asset condition
7 project, it could be asset management. But the
8 need is identified, and then initial funding is
9 procured for the engineers to do analyses to
10 scope out the need and to develop conceptual
11 solutions, which are then taken to the
12 engineering team to develop conceptual grade
13 estimates and to do preliminary engineering.

14 This solution is presented to the
15 Solutions Design Committee, if it's a substation
16 or transmission project. If it's a distribution
17 line project, it's presented to the New Hampshire
18 Project Approval Committee, the New Hampshire
19 PAC. And each of these committees, again, has
20 representation from all across the Company to
21 examine the case for need and to ensure that the
22 right solution is selected.

23 And then the full -- we go to what's

1 called Eversource Project Approval Committee, the
2 PAC. That's another committee that decides on
3 the funding. And once a project is funded, then
4 it goes into construction. And as I said
5 earlier, there's a prudency review that occurs
6 with -- with the PUC. So I will pause there.

7 My next two slides are on forecasting.
8 I just want to make sure that I get any planning
9 questions out of the way first.

10 CHAIRMAN GOLDNER: I think we're good
11 for the next slide.

12 MR. FREEMAN: All right. So I will
13 let Dr. Walker present the next slide. I could
14 present them, but he would do them more justice
15 than I can.

16 DR. WALKER: I think Mr. Freeman
17 already talked a lot about some of these
18 components. I repeat just as a quick overview of
19 how the process works.

20 Can everybody hear me? We get closer,
21 it works better.

22 So there's two -- two components to
23 how the forecasts are built. Number one,

1 Mr. Freeman already said, we review annually our
2 system peaks. So the first thing that happens in
3 the review of the system peak is that we record
4 net station load. So this is station load as it
5 is at time of peak at the station, but that
6 includes a lot of things. It includes
7 distributed generation that's offsetting some of
8 the load that can switch transfers at that
9 station at the time, which might increase the
10 load or decrease it under a normal -- normal
11 operating conditions.

12 So engineering reviews all of that and
13 corrects that. And just, FYI, for those who are
14 looking at the Bates page, that's 02107. Sorry.
15 I forgot that at the beginning.

16 So that gets corrected. We back in
17 generation, and then we do a 90/10 weather
18 adjustment. So that weather adjustment is
19 important. It was last summer -- not this
20 summer, but last summer was relatively mild, so
21 station peaks recorded at the station will come
22 in lower, and might lead to the wrong conclusion
23 that peaks are coming down. So corrections are

1 made to a standard weather model, and we correct
2 those values up to what the 90/10 weather
3 expectation is. So that leaves us with a gross
4 station peak, a 90/10 gross station peak.

5 Next slide, please.

6 MR. FREEMAN: And just, for example,
7 on this slide, I -- there's a Bridgewater Power
8 Plant. That's a 16.5 megawatt plant. It's a
9 biomass plant that exports power. We would take
10 that plant and back it out, because we don't
11 operate that plant. Similar for the Leominster
12 24 megawatt wind turbine, and the Amoskeag 16
13 megawatt hydro plant. Those are three examples
14 that this team would look at the output, how much
15 that output is masking load, and back it out. So
16 that when we build capacity, if during a
17 three-day heat wave that generation isn't
18 running, we are not on that size and equipment.
19 We want to make sure that we will see the right
20 load at the right time.

21 DR. WALKER: Yeah.

22 So at this point, we basically have a
23 weather normalized gross load, 90/10. So now

1 this is where the forecasting begins.

2 So a couple of things happen. We
3 build an economic model that looks out five years
4 to -- five to ten years to develop the trend
5 load, and then we have what's called out-of-model
6 adjustments. So energy efficiency programs would
7 be an out-of-model adjustment. Those get
8 subtracted from the projected load. DER forecast
9 gets projected, so it's the same thing on the
10 solar side. That's both for the existing DGs
11 that might offset the peak and anything that is
12 forecasted to offset the peak.

13 When we do those models, we do look at
14 time of day for the peak. So if it's 6:00
15 o'clock in the evening, the solar tends to have
16 less output at 6:00 o'clock, so that's adjusted.
17 So any numbers you see in the filing are
18 representative of the impact to peak, not the
19 installed capacity. Just make that distinction.
20 And then any changes on the system, such as
21 permanent load transfers, are taken into
22 consideration.

23 Now, on the -- on the additions. We

1 have already talked about the step loads in great
2 detail, so those are out-of-model adjustments,
3 where we have certain customer loads coming into
4 the system. Those are added in at the right
5 locations.

6 Another item, as we're starting to see
7 this, step by step, and Mr. Freeman already spoke
8 about it, is EV charging. Now, for the 10-year
9 forecast, the EV charging component is the
10 light-duty vehicle component, so this is your
11 at-home residential charging, opportunity
12 charging, et cetera.

13 Larger charging installations, like
14 fleet depots at the side of the interstate, you
15 name it, those come up under the step loads.
16 These are very locational. Those are very high
17 impact at that location, and, typically, more
18 than the 500 kilowatts, so we don't forecast
19 those. We work directly with the developers to
20 understand where they want to develop those so we
21 have precise locations because of the size of the
22 impact.

23 So that's the distinction here between

1 what goes into the forecast. That's the light
2 duty, that's a spread-out charging, and then the
3 very localized fleet depots charging
4 infrastructure that comes in through the step
5 load tracker. And that then gives us our
6 forecast. That's the high level of how this is
7 done.

8 Any questions on those two slides
9 before we go on?

10 CHAIRMAN GOLDNER: I think I just -- I
11 didn't quite fully grasp the base assumption on
12 the 90/10. Just, can you explain that a little?
13 I'm not sure that's terminology I'm familiar
14 with.

15 DR. WALKER: Yeah, so what 90/10
16 essentially means is that we look at the -- let
17 me rephrase this. It's the one out of ten-year
18 worst-case scenario that we're looking at.

19 CHAIRMAN GOLDNER: Okay.

20 DR. WALKER: So if we review the peaks
21 from the last ten years and the corresponding
22 weather at that time, the weather we look at is a
23 three-day weighted average Temperature-Humidity

1 Index. It's a very long term. But, essentially,
2 what's underpinning this is the statement that,
3 if you have just one hot day, that typically
4 doesn't do much to the load. Buildings are still
5 cool. Air conditioners don't need to do that
6 much. But if you have three hot days
7 consecutively, your load tends to keep creeping
8 up. So we look at the three-day rolling weighted
9 average. And if you have, over the last ten
10 years, certain values, essentially, in ten years,
11 one out of ten, we look at the highest value in
12 the last ten years. That's the 90/10.

13 CHAIRMAN GOLDNER: Thank you.

14 DR. WALKER: And that ensures that in
15 90 percent of the cases, your projected load is
16 not going to exceed that.

17 CHAIRMAN GOLDNER: Thank you. That
18 was helpful.

19 MR. FREEMAN: Okay. So I think the
20 next slide -- actually, this is the last slide.
21 I'd just like to conclude that the previous slide
22 on solutions, when you look at the DSP, the
23 solutions that were presented in the DSP are

1 really based on the process, and then the process
2 leads to the capital expenditure to ensure that
3 those solutions can be put in place.

4 And so I will turn it to my colleague,
5 Mr. Renard, to talk about the capital expenditure
6 summaries and some other issues. Unless there
7 are other questions, I cede my time.

8 CHAIRMAN GOLDNER: Anything else?

9 Please proceed. Thank you, Mr. Freeman.

10 MR. RENAUD: Thank you, Mr. Freeman.

11 And good morning. Paul Renaud, Vice President of
12 Distribution Engineering.

13 I think in that last session last week
14 you asked a question and, I think, Commissioner
15 Goldner, on us categorizing investments for you,
16 so I'm going to walk through that a little bit
17 today.

18 You know, we -- this will be the
19 same -- actually, the first slide you see will be
20 the same slide you'll see in Ms. Botelho's answer
21 to your question formally, but I will talk in a
22 little bit more detail on it, and you'll also
23 have more information filed in a PUC request.

1 But we do categorize these. These
2 aren't something we came up just -- came up with
3 just for this question. We use these categories
4 -- categories as a standard throughout the
5 Company so we understand where we're spending
6 money and how we're spending money, and, you
7 know, what's driving investment in the system.

8 You know, I will note that it's -- we
9 do categorize based on the primary driver of a
10 project, but as both Mr. Coates and Mr. Freeman
11 said, there are other things and other objectives
12 that we will focus on when we're doing projects.
13 So, just as an example, a customer-driven
14 project, the whole goal of connecting a new
15 customer is to ensure that existing customers
16 aren't harmed by that and the reliability is
17 maintained. So it is a reliability-driven
18 project, but it gets categorized as a
19 customer-driven project.

20 And there's other examples we can talk
21 about in this same way. But primary driver is
22 how we categorize these, so we know how we're
23 spending our dollars.

1 So turning to the slide here. You
2 know, I'm going to focus first on the left.
3 We've categorized our investment, and this is
4 referring to Bates page 2172. This isn't the
5 exact same chart that's on that page. That chart
6 shows a breakdown -- a five-year breakdown of
7 these numbers. This is a rollup of a '25 to '29
8 capital investment. I'll also point out that
9 that chart doesn't include one component that
10 I'll mention.

11 Here, we have four components of our
12 total plan. Our core capital operations, so
13 those are really the -- the base project that we
14 do, the poles, wires, substation equipment.
15 That's the equipment that we need to serve the
16 customers.

17 And then we have core capital
18 operation support. Those are kind of the other
19 support functions and spending that we need to
20 make all our operations work efficiently, and
21 that would include things like facilities. It
22 includes fleet. It includes information
23 technology investments. It includes customer

1 group, customer care shared services for how we
2 interact with customers, and it includes
3 telecommunication type of equipment, radios,
4 fiber, and those type of things.

5 So those would be captioned under core
6 capital operation support. That's the component
7 not in the DSP chart on 21 -- on Bates page 2172.

8 So just focusing a little bit on that,
9 you see -- of course, our core capital is the
10 bulk -- is the bulk of what we spend, 78 percent
11 of our dollars, and we want to maximize that, of
12 course, and try to minimize some of the operation
13 support as much as we can. The operation support
14 is 16 percent of our total capital. We do have
15 the other two components that we filed in this
16 case, the incremental grid mod and our
17 incremental resiliency.

18 I will start with the resiliency.
19 That's a \$70 million piece, about 4 percent. I
20 would turn this over to Ms. Ntakou at this point
21 to give a little brief, but she had to step out
22 for a time. If there's some questions, she'll be
23 back.

1 But that's really to focus on -- and
2 this is on Bates page 2149 of the DSP, where this
3 discussion starts, and this is to -- based on an
4 analysis done on the worst performing segments of
5 our system in order to maximize the dollars.
6 This is to focus on 48 out of 470 zones in a
7 program to target the most valuable and the
8 highest return with those segments, focused on
9 the reliability.

10 So then I would ask, if I could,
11 Ms. Schilling, who's on the virtual here, to talk
12 just briefly on the grid mod investments.

13 MS. SCHILLING: Good morning. Can you
14 hear me okay?

15 MR. RENAUD: Yes.

16 MS. SCHILLING: Okay. So the
17 incremental grid mod program is composed of three
18 different components. They are described in the
19 DSP starting on Page 02165. And the first
20 component is a Volt/VAR optimization program
21 that -- where we would install field equipment,
22 so capacitor banks, regulators, substation
23 upgrades, and the purpose is to improve how we

1 manage voltage on the system, so the --
2 increasing the efficiency of how power is
3 delivered reduces the energy needs of the
4 delivery. So it reduces line losses and also has
5 an impact on reducing peak loads. So the
6 Volt/VAR optimization program is one of the key
7 components of the grid mod program.

8 The second is a Distributed Energy
9 Resource Management System. So, you know, in New
10 Hampshire, we have a distribution management
11 system, which is a moving -- a functioning
12 real-time model of the system. The Distributed
13 Energy Resource Management System, or DERMS,
14 would be interfaced with that DMS to manage
15 customer and Eversource, if there were any, owned
16 distributed net energy resources, to be able to
17 control them for multiple-use cases on the
18 system. So it's kind of a control room
19 application that allows us to have communication
20 and control and send signals to solar or
21 batteries or demand response, like Wi-Fi
22 thermostats and water heaters in customers'
23 homes. So that second component is the DERMS.

1 The third component is system planning
2 tools. So Dr. Walker talked about kind of the
3 process that his team goes through to forecast
4 load and generation on the system, so this would
5 add some more kind of sophisticated analytical
6 tools to support those activities and increase
7 our ability to do -- to do probabilistic
8 planning. It also enables more sophisticated
9 interconnection processing, as well as hosting
10 capacity-type analysis that we can provide on the
11 system. So those are the three components of the
12 35 million over five years.

13 CHAIRMAN GOLDNER: Okay. Thank you.

14 MR. RENAUD: So then I'll turn to the
15 right side and break down our core capital
16 investments a little bit more. And these -- we
17 are -- you will get more detail on this in our
18 response to PUC RR-27, which you'll have a
19 breakdown of what I'm going to go through now.

20 The -- the -- the operations, we
21 further break these categories -- and we even go
22 beyond this, but we further break these down into
23 -- starting with a basic business, which is on

1 the right, the top -- the largest portion at the
2 top right, \$390 million. On that basic business,
3 those include categories of other communication
4 providers, Comcast and those, where we have to do
5 work because of existing conditions. If there's
6 car/pole accidents, for instance, there's
7 insurance claims. We have to do work because of
8 vehicle hits, things like that. That will go in
9 our basic business. We, of course, try to
10 recover that from folks. It's not always
11 successful, but we do work hard to get that money
12 back.

13 We do pre-capitalize distribution
14 transformers, not the power transformers at the
15 station, but distribution pole tops and the --
16 and a small amount of transformers, so those are
17 a pre-capitalized item every year, which is one
18 of the biggest components of this basic business
19 category.

20 Two -- two others, a very important
21 piece of our basic business, are emergent
22 equipment failures. We have two categories for
23 that. One is for line, and one is for

1 substation. So the emergent failure line item
2 for distribution lines is the largest component
3 of basic business category. Then we have
4 environmental and small capitalized tools that
5 are also in that category.

6 So next, moving down around --
7 clockwise around the chart here, \$156 million is
8 for new customer. That is to serve new customers
9 that come along. We do have reimbursements to
10 customers for -- for everything we do.

11 Continuing down along at the bottom,
12 you see our peak loading capacity, 202 million,
13 about 16 percent. And here I'll just pause and
14 give you a little comparison, because there was a
15 discussion about, you know, what our investment
16 needs are compared to peak -- peak load growth.

17 As you can see, though, it's fairly
18 small, if you look at just 16 percent of the core
19 capital. If you include core capital operation
20 support, it's about 13.2 percent. And then if
21 you include the grid mod and the resiliency
22 components that we're adding in in the rate case,
23 that goes down to about 12.3 percent. So

1 relatively small.

2 And I'll just kind of reiterate my
3 point, either when we're doing -- and to
4 Mr. Freeman's point, when we're doing peak load
5 capacity projects, we're looking at liability
6 issues that we should be solving at the same
7 time, and if it's a station job, we need to
8 replace related capacity. So some of those would
9 be reliability regime in that. But the peak load
10 is the primary driver.

11 So then moving on to the biggest
12 component of our core capital is reliability, and
13 \$513 million over the five years, 40 percent. We
14 did break out CCI pole replacement. Our pole
15 replacement program is in -- is in the
16 reliability category. CCI pole replacement would
17 normally be in the reliability category, so since
18 it was a separately approved category, we just
19 broke it out for this purpose.

20 You know, that -- that breaks out into
21 our -- our distribution automation program that
22 we talked about. We have a distribution line
23 component in there, which -- which is one of the

1 larger components. We have a distribution
2 right-of-way component, where we talked about
3 moving lines that are problematic out to streets,
4 if -- if possible, if that's the right solution
5 as we go through our -- our SPC process.

6 We have a distribution substation
7 reliability, which, actually, now is our biggest
8 component of the reliability. We're really
9 focused on transformer assets at this point. And
10 then I mentioned CCI.

11 So those are the components of
12 reliability that -- that you'll see in our plan.

13 CMSR. CHATTOPADHYAY: Question.

14 MR. RENAUD: Yes.

15 CMSR. CHATTOPADHYAY: Would it be
16 possible to provide a similar chart for, let's
17 say, 2021 to 2024?

18 MR. RENAUD: You will have that, and
19 we have provided that in the Record Request 27 --
20 PUC 27.

21 CMSR. CHATTOPADHYAY: In a chart form
22 like this?

23 MR. RENAUD: It's in a table form. We

1 can put it in a chart form if you want, yes.

2 CMSR. CHATTOPADHYAY: Yes.

3 CHAIRMAN GOLDNER: Just following up
4 on that, just from a numerical perspective. I'm
5 searching for 27 right now. I don't see it
6 immediately, but what -- how would the total
7 compare, 1.6 billion, versus what it would have
8 been in 2019?

9 MR. RENAUD: So that's a five-year
10 total that -- you're asking for the five-year
11 total from 2019 on?

12 CHAIRMAN GOLDNER: From the prior rate
13 case, yeah.

14 MR. RENAUD: I can get that, not very
15 -- at my fingertips, but we'll provide it.

16 CHAIRMAN GOLDNER: Yeah, that will be
17 very helpful. Just, you know, what was it last
18 time versus what was it this time. That's a
19 helpful reference on a five-year basis.

20 MR. RENAUD: Sure.

21 CHAIRMAN GOLDNER: Thank you for that.

22 And my second question -- anyone can
23 answer. So how much of this that we're looking

1 at here, the 1.6 billion, would fall into PBR and
2 how much would not?

3 MR. HORTON: Doug Horton with
4 Eversource. I can start. Ms. Botelho, please
5 chime in.

6 So if we're looking at this chart --
7 and I believe this is one of the follow-up
8 questions you had asked, which we intend to put
9 in writing just to try to make it very clear and
10 distinct. But the way I would say it is that all
11 of the blue, which is the core capital operation
12 support for capital operations, that is -- well,
13 I would say -- first, let me take a step back.

14 All and any capital would be a
15 component of the K-bar, to the extent that K-bar
16 provides recovery of that capital. We're not
17 proposing that there would be a separate
18 reconciling mechanism outside of the K-bar. So
19 that the way that we originally presented the
20 K-bar is that the blue-shaded categories here
21 would be part of the K-bar calculation and part
22 of the K-bar cap that we presented in Exhibit
23 ES-DPH-2. Then what we have proposed is that, if

1 the PUC, through this rate case, supports our
2 pursuit of the incremental grid modernization/
3 gold bar optimization, so the red on the left,
4 and/or the incremental resiliency, so the 70
5 million on the left, those investments, if
6 supported, would also flow through the K-bar, and
7 would flow through the K-bar by us adjusting that
8 cap presented in Exhibit ES-DPH-2.

9 So that one of the follow-up questions
10 was essentially, show us what's the cap as
11 proposed, show us what's the cap if grid
12 modernization is supported. Those would be two
13 known -- known quantities today.

14 The only other exceptions to that, but
15 that would still flow through the K-bar, would be
16 co-optimization projects and Company-owned solar.
17 Company-owned solar, as Mr. Belden mentioned,
18 would be a separate process under which we would
19 present to the PUC separately for review and
20 approval. And to the extent that that gets
21 approved, similarly, to the co-optimization, any
22 costs that would be recoverable would then just
23 flow through the K-bar mechanism.

1 And the way that each of those two
2 categories would work -- the two categories being
3 Company-owned solar or co-optimization efforts --
4 those would flow through the K-bar by the similar
5 adjustment to the way that the cap would be
6 calculated.

7 In other words, we would set the cap
8 today, and then in the event either of those
9 things happen, we have a Company-owned solar
10 project that gets approved for us to move
11 forward, or we have a co-optimization project
12 that, through this process, gets approved, that,
13 yes, you know, it would be allowed to flow
14 through the mechanism, there would just be an
15 adjustment to the cap so the K-bar wouldn't be
16 capped out by the inclusion of those initiatives.

17 CHAIRMAN GOLDNER: Okay. Let me see
18 if I can repeat that back. So the blue portion
19 here, both the dark and the light blue, are both
20 in the K-bar that you presented last week, and
21 those were the fixed values by year that the
22 Company presented.

23 If there -- there would be a separate

1 review and separate process for Company-owned
2 solar and the co-optimization, where the Company
3 would come in between now and 2029 and would
4 present their proposal. If the proposal was
5 approved, then it would increase the K-bar value
6 for the relevant year, and that's the way that
7 part works.

8 For the red and the yellow on this
9 chart, so the incremental grid mod and
10 incremental resiliency, how would that work
11 again?

12 MR. HORTON: So it would work similar
13 to the first two categories. So all that would
14 happen is -- the way we had presented it is,
15 should the PUC, as part of this rate case
16 proceeding, reach a conclusion to support those
17 investments that are in the red and the yellow,
18 so incremental grid modernization, gold bar
19 optimization is the red, incremental resiliency
20 is the yellow, so 105 million.

21 If, through this rate case process,
22 the Commission were to conclude, yes, those are
23 worthy infrastructure investments to pursue, then

1 we would recast that K-bar cap today and include
2 those investments, just like we have the
3 blue-shaded colors included today. It's just
4 simply to say that we're -- our base K-bar
5 wouldn't include those. These projects, although
6 valuable, would be de-prioritized, unless the
7 K-bar were adjusted to accommodate them.

8 And so we would do that, effectively,
9 with a decision in this order. We would say,
10 okay, the K-bar mechanism and the cap upon that
11 K-bar mechanism will be set to reflect those
12 planned investments.

13 CHAIRMAN GOLDNER: Okay. Said only
14 slightly differently, if the Commission were to
15 approve the 35 and the 70 million in incremental
16 upgrade grid mod and incremental resiliency, that
17 would have the effect, in this rate case, of
18 increasing each of the yearly values of the
19 K-bar?

20 MR. HORTON: Correct. It would
21 increase the amount that could flow through the
22 K-bar. And I only say that distinction because
23 the K-bar, in the end, is going to be based on

1 what's actually in service. It's the cap that
2 would be adjusted today to reflect the planned
3 activity into the future.

4 CHAIRMAN GOLDNER: Okay. And that
5 would -- so that would enter into the rate case
6 K-bar cap. And then, remind me again, please, if
7 the -- the cap is set to, let's just say, a value
8 of 200, and the Company only spends 190, is the
9 Company entitled to the 200 or the 190?

10 MR. HORTON: It would be to the 190.

11 CHAIRMAN GOLDNER: Okay. So the cap
12 is truly a cap. It's not the known value that
13 the Company would charge.

14 MR. HORTON: Exactly. The K-bar is
15 based -- the actual -- we're presenting our
16 estimate of the K-bar, and we're presenting a
17 K-bar cap. And that K-bar cap would be set
18 today. But each year the k-bar would be in
19 effect, it would only be based on the actual
20 additions, with the exception of that one first
21 transition year that Mr. Kallen was talking about
22 last time, but a detail not to get us lost on
23 this. The K-bar is based on actual additions

1 over the course of the PBR term.

2 CHAIRMAN GOLDNER: Okay. Very good.

3 And my only comment -- and this is a little bit
4 of a repeat from before. But my encouragement,
5 at least for the Commission's benefit, to any
6 K-bar proposal that would come before us would be
7 a cap value, not cap plus 12 percent or 10
8 percent or some other percent. Just let us know
9 what that cap is. That would be the request from
10 the Commission in terms of our visibility in
11 terms of what the max is.

12 MR. HORTON: Yes, sir.

13 CHAIRMAN GOLDNER: Thank you.

14 Yes.

15 CMSR. CHATTOPADHYAY: Again, I'm
16 trying to capture what is being presented here,
17 so the -- all of these costs, the blue, the red,
18 and orange or yellow, they are all part of the
19 K-bar?

20 MR. HORTON: They would all be part of
21 the K-bar, correct.

22 CMSR. CHATTOPADHYAY: And for the
23 solar project that the Company is thinking about,

1 as well as the co-optimization, you know, project
2 that you talk about in your -- in the testimony,
3 which is in 02011, or near abouts, it's --
4 those also will be part of K-bar?

5 MR. HORTON: They would be part of
6 K-bar. And I think, maybe to try to simplify it,
7 and we will -- this has clearly created
8 confusion, and we see that, and that is one of
9 the follow-up requests we have, and I think it
10 will help putting it on paper and hopefully
11 simplify.

12 But the way that I think of it is the
13 K-bar is a capital support mechanism, so any
14 capital would be reflected in the K-bar, knowing
15 that the K-bar is not dollar for dollar.

16 So what we're trying to do in the
17 initial proceeding is, we've designed the K-bar
18 to reflect our core investments and the core
19 capital expenditures, which are the blue-shaded
20 areas. And then we've identified three other
21 categories that wouldn't be pursued under just
22 that base operation of the K-bar. Those three
23 categories are the incremental grid modernization

1 investments, so the red and the yellow. The
2 second category is co-optimization, and the third
3 category is the Company-owned solar.

4 So, really, what we're trying to do
5 with those three categories is to allow -- if we
6 move forward, if they get supported, we would
7 just simply be tweaking the K-bar formula to
8 allow for those capital costs to flow through the
9 formula and not to be, essentially, capped out.

10 In other words, we're setting a cap
11 now, to Chair Goldner's direction, wanting to
12 know what that cap is, which we've calculated in
13 Exhibit ES-DPH-2. And if we move forward with
14 the Commission's blessing on any of those three
15 things, which would cause us to be capped out,
16 we're simply saying, well, if we are encouraged
17 to move forward with these projects, we would do
18 so and then adjust the cap. If we don't spend
19 the money, it wouldn't go through the K-bar,
20 because it's based on actuals. It would only be
21 allowing that cap to be reflective of the support
22 to move forward with those investments, and each
23 has a little bit different flavor to them.

1 CMSR. CHATTOPADHYAY: Okay. Thank
2 you. Let me summarize. I think it's import --
3 that was very helpful.

4 Essentially, the K-bar, as set,
5 includes the blue and the red?

6 MR. HORTON: Just the blue.

7 CMSR. CHATTOPADHYAY: Just the blue.
8 Okay.

9 MR. HORTON: Just the blue.

10 CMSR. CHATTOPADHYAY: But you're also
11 saying, if the other projects are undertaken,
12 allow us to change the K-bar; that's what you're
13 saying?

14 MR. HORTON: That's what we're saying.
15 You got it, yes.

16 CMSR. CHATTOPADHYAY: Thank you.

17 CHAIRMAN GOLDNER: And those
18 community-owned solar or co-optimization projects
19 would come in an annual filing?

20 MR. HORTON: The community-owned --
21 the Company-owned solar projects would be a
22 separate process that would not move forward,
23 except for that separate process.

1 The co-optimization projects, what we
2 envision there -- and there are not many, but
3 they could be sizeable. I believe we have two on
4 our radar currently. That would be -- again, if
5 this is adopted in this proceeding, that would be
6 more of an annual compliance process, where we
7 would update the Commission that this project is
8 intended to happen next year, providing insight
9 and clarity. We wouldn't be seeking
10 preauthorization or pre-approval. It would just
11 be a notification that these projects are coming,
12 and then the K-bar -- once in service, the K-bar
13 we present would do what Commissioner
14 Chattopadhyay just said, that we would,
15 effectively, then adjust the K-bar, once the
16 additions have been made, to adjust the cap to
17 reflect those additions have been made.

18 So the co-optimization is just a
19 little -- it doesn't -- we're not asking for,
20 like, a separate preauthorization or
21 pre-approval, other than, again, as part of this
22 proceeding, the acknowledgement that -- realizing
23 these projects, although rare, can be significant

1 and would potentially cause us to go over the cap
2 when there's good reason for us to adjust the cap
3 to allow for them to flow through.

4 CMSR. CHATTOPADHYAY: For the
5 co-optimization projects, it's an annual process,
6 but that annual process would also allow the
7 Commission to determine whether those are
8 prudently incurred?

9 MR. HORTON: Our vision is -- again,
10 for administrative efficiency, that the K-bar, as
11 it's operating, isn't providing dollar-for-dollar
12 recovery of any individual or any one investment.
13 So our -- the way we're viewing the K-bar would
14 be that that prudence review would be undertaken
15 at the next rate case, as it is today.

16 So that we wouldn't be intending to at
17 least present for the Commission's review with
18 each K-bar the prudence of any capital additions
19 along the way, because part of what we're trying
20 to achieve is that administrative efficiency and
21 to -- but still have full prudence review, and be
22 subject to prudence review.

23 CMSR. CHATTOPADHYAY: I think we -- we

1 went through the back-and-forth the second day of
2 the technical sessions here. I'm a little bit
3 confused about -- so you have an annual ability
4 to change the K-bar based on what you spend on
5 the co-optimization projects, and you -- but --
6 but, ultimately, it's going to be the next rate
7 case where you will allow the Commission or the
8 parties to go into the spend and determine
9 whether that was prudent or not.

10 And so the gray area that I'm
11 struggling with is, when you have these annual
12 submissions, is there a way to also say, you
13 know, that it's -- I mean, if you're going to
14 tell me you're going to spend a billion dollars
15 and that's going to be changing the K-bar, at
16 some point that is not, you know, just and
17 reasonable or cannot be prudent, so there --
18 there must be a way to a certain -- that when you
19 propose something, which you're going to be
20 allowing us to take a look three years or four
21 years down the road, there should be some sort of
22 a -- some sort of way to judge whether what has
23 been produced is just and reasonable, so that's

1 what I'm struggling with.

2 MR. HORTON: I understand. And I -- I
3 hadn't thought of it in that way, until you just
4 said it.

5 I think for the co-optimization
6 projects, again, as we're sitting here, there are
7 not many. But I understand the concern, which
8 would be that, again, here we're essentially
9 saying we haven't included co-optimization
10 infrastructure investment in the cap, so our
11 request was to have an exception to the cap to
12 accommodate those.

13 Your concern is that this -- I
14 understand, which is, if the Commission was to
15 give us that agreement as part of this rate case,
16 what is to stop us from coming in in Year 2 or 3,
17 notifying the Commission we have this opportunity
18 that's an additional billion dollars and that
19 would naturally flow through the cap, so -- I
20 don't know how to accommodate that in this
21 setting. Certainly, that's not our intention,
22 and I'm sure we could, you know, come up with
23 some ways to put some guardrails around it, and

1 that's a -- I understand that mechanically would
2 be a concern, but we haven't addressed it.

3 CMSR. CHATTOPADHYAY: Thank you.

4 MR. HORTON: But I'm certain it could
5 be.

6 CHAIRMAN GOLDNER: Just following up
7 on that a little bit. Just, traditionally, this
8 is the kind of investment that would wait until
9 the next rate case, and that would be maybe the
10 conventional way of handling it.

11 Here, the Company is proposing that
12 this is included in sort of an interim adjustment
13 in the revenue requirement between 2025 and 2029.
14 You know, where I'm -- where I'm just lost, and I
15 think it's in the same place Commissioner
16 Chattopadhyay was asking about, is I don't know
17 how to approve an increase in the revenue
18 requirement, in the K-bar, in the interim without
19 reviewing the project, so I don't -- it's a
20 chicken-and-egg thing, so I don't -- I just
21 wanted to give you an opportunity to respond to
22 that.

23 MR. HORTON: And I think if I -- I

1 understand the concern. Again, these are limited
2 on the co-optimization side. They're limited to
3 be few and far between, but could be significant
4 on their own. So I'm certain there could be a
5 way to work through that in the mechanics of the
6 K-bar, but I don't know how to resolve for that
7 now. I think, you know, in writing, as part of
8 the response, we can take that back and --

9 CHAIRMAN GOLDNER: Yeah, we're just
10 trying to understand, in this setting, what the
11 Company's proposal is, and I think you made that
12 clear, so I appreciate that.

13 And just a quick follow-up on the
14 solar piece. I think what you were saying is
15 that's not really envisioned in being in the
16 annual process. That's really ad hoc. You come
17 up with an opportunity and you present that, as
18 Unitil did, when and -- when the presentation or
19 when the proposal is available.

20 MR. HORTON: Exactly. And then the
21 result of that proceeding, which would be a
22 separate process, would then just allow for that
23 project to flow through the K-bar, but after

1 having been -- gone through that proceeding
2 before you.

3 CHAIRMAN GOLDNER: And I think the
4 Company said earlier that this is, in the
5 Company's mind, clearly a 374-G. It would mirror
6 the Unutil proposal, and so in the Company's
7 mind, that's very -- a very closer process.

8 MR. HORTON: Yes.

9 CHAIRMAN GOLDNER: Okay. Thank you.

10 CMSR. CHATTOPADHYAY: And --

11 CHAIRMAN GOLDNER: Yes.

12 CMSR. CHATTOPADHYAY: I suppose the
13 co-optimization projects, why can them -- or
14 projects, why can them be also treated like the
15 solar? And so you have a process where we will
16 have the ability to see whether it's prudent or
17 not, and then it can go into the K-bar.

18 MR. HORTON: And I think they could.
19 That wasn't our original -- because of the
20 reasons that I said, but I think that certainly
21 is a process that could work.

22 CMSR. CHATTOPADHYAY: Thank you.

23 CHAIRMAN GOLDNER: Okay. This is a

1 really good slide, so thank you for that.

2 MR. RENAUD: So no other questions on
3 that slide? We can move on?

4 CHAIRMAN GOLDNER: We might come back
5 to it later, but I think for now, we can move on.

6 MR. RENAUD: So we can go to the next
7 slide, then. So sticking with the questions you
8 asked about our investment, why our investment,
9 in light of load growth, you know, discussions
10 about overbuilding and gold-plating and those
11 types of things, we did want to talk a little bit
12 about -- about the -- this process that we
13 underwent and why, you know, the aging condition
14 of our system and our standards. You know, all
15 the investments that we've talked about,
16 Mr. Freeman talked about, is grounded in
17 criteria. I think we mentioned this last week,
18 standards that we bill to and that are outlined,
19 and that's how we determine how to design our
20 projects.

21 So, you know, as part of the
22 Settlement Agreement in the last rate case, we --
23 we hired a consultant, an independent consultant,

1 to come in and review our practices and
2 procedures, review those standards. There was a
3 lot of discussion on our standards of were they
4 appropriate, were they overbuilding or not.

5 So this -- this report, TRC was the
6 company that did the analysis, and they filed a
7 report. That report is available to the -- to
8 the parties in response to OCA 3-2. But just
9 to -- you know, specifically, they came in and
10 looked at these items that are bulleted here:

11 Use of distribution-class steel poles as a
12 standard in off-road right-of-way. Use of Class
13 2 wood poles -- and Class 2 are bigger -- bigger
14 diameter, stronger poles that we put in the
15 system -- and as a standard for roadside primary
16 distribution, where we're not -- we're not
17 talking about putting steel poles on roadside.
18 Those are limited to right-of-way at this point.
19 Use of spacer cable as a standard for overhead
20 conductors.

21 So if folks don't know what spacer
22 cable is, that's a bundled conductor that you'll
23 see. It's got a messenger, and the phases are in

1 close proximity to each other, which very strong,
2 very sturdy construction is used, especially in
3 heavily treed areas.

4 The use of fiberglass crossarms,
5 planning standards for line relocation and
6 reconductoring activities. Substation
7 transformer and circuit breaker replacement
8 processes, and then vegetation management
9 processes on top of that.

10 So I pulled some key findings from
11 that report. These are -- these are right out of
12 the report on system conditions. So I'm just
13 going to go through this. I have three slides
14 here. I really only focused on this first one,
15 because it really kind of comes to the -- to the
16 system and their key findings and why we're
17 proposing the investment that we're proposing in
18 the system.

19 Many distribution components are
20 beyond their expected life, require replacements
21 to maintain system reliability and resilience. A
22 substantial number of the wood poles, circuits
23 with a primary conductor, substation breakers and

1 substation transformers are at the end of their
2 lives, and we have charts that are in the DSP
3 that show these statistics.

4 Many wood poles are structure
5 overloaded due to their age and number of
6 attachments to poles as they age, and whether
7 they shrink, they lose strength. That's why we
8 have inspection. That's why the industry
9 inspects poles periodically, because they lose
10 strength over time.

11 Many circuit lines in the right-of-way
12 are inaccessible due to location and difficult to
13 maintain. So we do look closely at our
14 rights-of-way. Many times it is the right place
15 for a line, but it is hard to access in times
16 when something happens, so the stronger
17 construction in those areas is warranted.

18 And then trees and canopy are in close
19 proximity to distribution system. Of course, we
20 know that here. And it makes lines vulnerable to
21 outages.

22 So the recommendations here are really
23 to accelerate the replacement of our aged

1 equipment. That includes poles, circuit
2 breakers, transformers, with systemic plans,
3 which we've done in our long-range plan and our
4 DSP.

5 Replace woods that are structurally
6 overloaded 90 percent or more. We do our
7 inspection program to come up with the numbers
8 that we file in the plan, including the CCI,
9 which -- which I'll just add a commentary on CCI
10 poles. We're are actually replacing fewer poles
11 than we projected, which is good. We projected
12 that we would have 5 to 7 percent, which is the
13 number that we would have to replace during that
14 process, and we are in the 2 to 3 percent range.
15 So we're not replacing as many as we thought we
16 had to, so that's a good outcome there.

17 Increasing vegetation management, not
18 really a part of this proceeding here, but -- and
19 then consolidate current resilience hardening
20 efforts into an overarching program. Again,
21 which we've done here as part of our DSP and,
22 really, why we filed this as part of this case.

23 So if you could move to the next

1 slide, please.

2 So I'll just highlight on this page,
3 just the next two go into some details on their
4 recommendations in specific areas. But, as
5 Mr. Lavelle [sic] went through the distribution
6 planning, you know, I think -- I think they
7 cooperated in areas for what we do, and they
8 did -- they did tie it directly to reliability.

9 If you look at the recommendations,
10 I'll -- I'll kind of focus -- reduce the number
11 of feeders without the capability to allow for
12 circuit reconfiguration and load pickup
13 throughout the system.

14 So we have focused on that, and we
15 talked about that a bit here, building ties
16 redundancy in order to help us restore the bulk
17 of customers faster.

18 And I think we go to the next page
19 there, which just talks about the benefits of
20 steel poles. And this is according, again, to
21 TRC, the consultant, and their view of industry
22 best practices, which was really why they were
23 brought in to compare how we're doing things

1 against what the industry is doing.

2 So I think -- I think with that, I'll
3 stop, and if there's any questions, we can go
4 there, or we can go back to any topics we covered
5 here in the presentation.

6 CHAIRMAN GOLDNER: Commissioner
7 Chattopadhyay, any questions? (No response.)

8 Okay. I think we're at a -- pretty
9 close to a natural stopping place.

10 Attorney Chiavara, what would the
11 Company envision that it would like to do after
12 lunch?

13 MS. CHIAVARA: At this time, the
14 Company is ready for Commissioner questions.

15 CHAIRMAN GOLDNER: Okay. I think we
16 received some record requests last night, but
17 those were all, I think, related to cap X, so we
18 can -- any questions on that we can defer to a
19 following PHC, so that was okay.

20 And then the clerks had sent us two
21 PowerPoints, the one that we've just gone
22 through, and one where the Company had answered
23 Commissioner questions from last week. It's a

1 lot to process. I just flipped through it. Is
2 that something that the Company would want to
3 maybe give us a high-level overview of and then
4 give us a chance to study and then come back in a
5 subsequent session, or how did you want to
6 address the answers to the questions?

7 MS. CHIAVARA: I believe we can walk
8 through that today if you would like.

9 MS. BOTELHO: Yeah. We can do
10 whatever you prefer. There is a lot of
11 information. It's directly responsive to your
12 follow-up request, so a lot of information. You
13 asked for a side-by-side comparison.

14 I mean, it may make sense for -- if
15 you want to take it back, and we can come back
16 for questions. I can orient you on what we
17 provided, if that makes sense, and then you'll
18 have another opportunity to ask questions on it.
19 There's a lot of material there, so I just want
20 to be sensitive to the fact that you just
21 received it.

22 CHAIRMAN GOLDNER: Oh, thank you. I
23 think -- Commissioner Chattopadhyay and I can

1 talk at the lunch break. It looks like the kind
2 of thing where we would want some time to study
3 it and then maybe follow up with the Company in a
4 subsequent technical session. There's a lot of
5 information here, and we appreciate the prompt
6 response to last week's questions.

7 Okay. Let's do this. Let's take a
8 one-hour lunch break, returning at 1:00 p.m.

9 (Luncheon recess taken.)

10 CHAIRMAN GOLDNER: Okay. We'll go
11 back on the record and begin with Commissioner
12 questions. After Commissioner questions, we'll
13 provide an opportunity for any of the
14 participants to ask any questions of the parties,
15 and we'll adjourn. So I'll start.

16 We talked a little bit about the
17 Company's solar -- Company on solar plans, and
18 nowhere in the file, and it wasn't mentioned
19 earlier today that I caught, anyway, did the
20 Company discuss its long-term, Company-owned
21 solar plan.

22 Does the Company have one?

23 MR. BELDEN: So I can speak to that.

1 I would say at this point, the Company is
2 planning something preliminary, and we'll be
3 filing something as a pilot. Based on the
4 results of that pilot, we would be developing a
5 long-term plan.

6 CHAIRMAN GOLDNER: Okay. Is the pilot
7 in New Hampshire or elsewhere?

8 MR. BELDEN: It would be in New
9 Hampshire.

10 CHAIRMAN GOLDNER: Okay. Does the
11 Company have defined Company-owned solar plans in
12 other states?

13 MR. BELDEN: The Company currently
14 owns 22 solar projects in Massachusetts that were
15 developed in the last decade, so our last system
16 went online in 2018.

17 We reached our legislative tab for
18 Company-owned solar in Massachusetts, so we have
19 no further plans at this point.

20 CHAIRMAN GOLDNER: Okay. And that is
21 22 facilities, I think you said. How many --
22 what's the capacity of those?

23 MR. BELDEN: Those are 70 megawatts

1 total.

2 CHAIRMAN GOLDNER: How many?

3 MR. BELDEN: 70, 7-0.

4 CHAIRMAN GOLDNER: Okay. Thank you.

5 Next question is related to the DER.

6 Is there a unified view that the Commission and
7 the parties can see that incorporates the
8 Company's forecast of the DER implementation and
9 the resulting hardware/software counterbalanced
10 against the benefits? Is there sort of a unified
11 view somewhere that we can see?

12 DR. WALKER: Just to clarify. I'm not
13 entirely sure what you're looking for.

14 CHAIRMAN GOLDNER: So in the filing --
15 and it looked like there was about \$25 million
16 worth of costs, so the 35 -- I don't have the
17 chart up yet -- of the 35, I think I saw in grid
18 modernization 25 was under DERMS, so there's some
19 costs associated with it, and I'm just trying to
20 understand the benefits and costs and how the
21 Company looked at that overall picture.

22 DR. WALKER: I'll have to refer to
23 Ms. Schilling on the DERMS topic.

1 MS. SCHILLING: Okay. Good afternoon.
2 Yeah -- no, thanks for the question.

3 So just to be clear, the total grid
4 mod is 35 million for the five years. Of that,
5 8.5 is the distributed -- is the DERMS. And I
6 think your question, if I understood it
7 correctly, so correct me if I'm wrong, is that
8 have we done any cost/benefit on would we expect
9 to see more than \$8.5 million worth of benefit
10 associated with \$8.5 million worth of cost; is
11 that your question?

12 CHAIRMAN GOLDNER: Correct. Yes.

13 MS. SCHILLING: We have not, to date,
14 done any formal cost/benefit analysis, so we --
15 there's nothing like that we could -- that we put
16 together that we would be able to produce, but in
17 -- you know, in our justification of the
18 technology, the benefits are that if -- if we are
19 able to control, let's say, an aggregated number
20 of water heaters or a large-scale solar facility,
21 that that would contribute to the benefit on the
22 distribution system, and that would then go into
23 the planning process. It would have those kinds

1 of associated benefits of grid management. But
2 we haven't quantified the value of that, no.

3 CHAIRMAN GOLDNER: Okay. Thank you
4 for that. I would -- that's just always
5 something that's interesting to the Commission to
6 have, you know, discrete elements with a
7 cost/benefit analysis so we can understand what's
8 being proposed and that -- that balancing that,
9 ultimately, we're asked to do.

10 Okay. Thank you. That's helpful.

11 MS. SCHILLING: If it's helpful, we
12 could try and summarize that in writing, the
13 drivers of benefit relative to the cost, and put
14 -- and see if there's some way to, at least based
15 on our understanding of the system, try to
16 quantify that in some way. We just haven't done
17 it to date.

18 CHAIRMAN GOLDNER: Okay. Thank you.
19 Yeah, ultimately, when we -- when we look at this
20 in the final hearing process, we would definitely
21 want to understand the various elements and the
22 cost/benefit. That's just one that came to mind,
23 because I thought I had captured 25 million for

1 DERMS. It sounds like it was 8.5.

2 But in any case, each element of the
3 grid modernization and the other pieces, it's
4 just helpful to know how the Company views the
5 cost and benefit, so thank you.

6 MS. SCHILLING: Absolutely.

7 CHAIRMAN GOLDNER: Thank you.

8 Okay. Okay. Moving to resiliency
9 investments, which I captured as targeted
10 under-grounding, reconductoring and vegetation
11 management. There's 48 projects shown in the
12 filing. I think it's Bates pages 2003 and 2004.
13 Is -- are these 48 projects, is that aligned to
14 the 513 million that we looked at this morning in
15 that circular chart, or is that -- are those --
16 is that a subset, or there's different things?
17 How -- how do I think about those 48 projects and
18 the 513 that you showed on the chart?

19 DR. NTAKOU: So the -- this is Elli
20 Ntakou for Eversource.

21 The 48 projects correspond to a \$150
22 million plan, which is a ten-year plan. So in
23 the five-year chart that you saw, it's the yellow

1 \$50 million portion.

2 CHAIRMAN GOLDNER: I'm sorry? How
3 much again?

4 DR. NTAKOU: It's the yellow, 50
5 million -- 70 million.

6 CHAIRMAN GOLDNER: 70 million.

7 DR. NTAKOU: 70 million. Sorry.

8 CHAIRMAN GOLDNER: Okay. So that's --
9 so 70 million -- so that's -- incremental
10 resiliency is this 70 million. Okay.

11 Okay. So what I was confused about
12 was the reliability portion is the 513, so I was
13 mixing my metaphors there. And the 48 projects
14 are actually resiliency, which is 70 million.
15 Thank you for that clarification.

16 So just to repeat that back, 70
17 million was the five-year plan. 150 was the
18 ten-year plan.

19 DR. NTAKOU: Right.

20 CHAIRMAN GOLDNER: Okay. Thank you.

21 On Bates 1991, there's discussion of
22 the advanced forecasting system, which shows up
23 in grid modernization. Does the Company have an

1 ask with respect to advanced forecasting system,
2 or is this something that you're just advising
3 us, that ultimately gets baked into a grid
4 modernization?

5 DR. WALKER: There is a portion of the
6 grid modernization that's attributed to that.
7 For the specific numbers -- Ms. Schilling, are
8 you still here?

9 The question was, of the grid
10 modernization funds, how much of that is
11 contributed to the advance forecasting?

12 MS. SCHILLING: Give me a sec.
13 4 million.

14 CHAIRMAN GOLDNER: Thank you. And
15 this is very helpful, because now you said 35
16 million was grid modernization, 8.5 was DERMS, 4
17 million was forecasting. That leaves hosting
18 capacity, interconnection automation and VBO as
19 the others.

20 Can you maybe just walk us through
21 what each of those are and how that sums to 35?

22 MS. SCHILLING: Sure. The 4 -- I'm
23 sorry if I wasn't clear. The 4 million is the

1 sum total of hosting capacity, interconnection,
2 automation and system planning tools, so those --
3 that as a total is 4. So the remainder is 22.5,
4 which is all VAR optimization.

5 CHAIRMAN GOLDNER: Perfect. Thank
6 you. And then the engineering question. There
7 was an attempt made to describe this to the
8 Commission previously, and, unfortunately, I
9 didn't quite follow.

10 Could the engineering folks just maybe
11 give us the high-level summary of how the VBO
12 results in lower costs to customers as it related
13 to benefits? Tell us more about VBO, a little
14 bit, and how -- what the benefits are relative to
15 the costs.

16 MR. FREEMAN: Ms. Schilling will do
17 that.

18 CHAIRMAN GOLDNER: Oh, perfect.

19 MS. SCHILLING: Sure. Sure. I'd be
20 happy to.

21 So the way -- when we're conducting a
22 benefit/cost analysis for VBO, we look at the --
23 the sources of benefit associated with energy

1 reduction and peak load reduction and then the
2 associated carbon emission reduction, when you
3 have these sources of efficiency.

4 So, as I mentioned, the idea of
5 volt/VAR optimization is to increase the
6 efficiency of delivery. So the losses -- the
7 energy losses from, you know, source to load
8 is -- we can calculate that in terms of kilowatt
9 hours, and then we turn that into a dollar figure
10 based on a -- kind of a general system-level
11 dollar per megawatt hour of cost of energy.

12 We do the same for demand and then
13 translate that into the associated carbon
14 emissions.

15 So the important thing to remember
16 here is that -- you know, the benefits depend
17 on -- to -- you know, kind of how those costs are
18 seen by customers. So a little bit of it is --
19 and it is a little portion, but every -- every
20 customer on a VBO feeder, it takes a little less
21 energy to supply them, so they will see it in
22 very small -- very small -- I don't mean to
23 over-promise this. It's not like customers are

1 going to automatically see a noticeable bill
2 savings, but it will show up a little bit in the
3 delivered energy to our customers. That's one.

4 The other is line losses are
5 socialized -- it's a cost, and that's kind of
6 pancaked to all customers. So anything we can do
7 to reduce the inefficiency of delivery is a
8 benefit to all customers.

9 And then demand reduction is a benefit
10 in terms of, you know, our costs to the
11 transmission system are based on kind of the sum
12 total of New Hampshire peak load, so that helps
13 to reduce that cost.

14 And then, to the extent -- you know,
15 carbon emissions we kind of included as an extra
16 benefit, because it's a little less realized.
17 But if you took that, we would just base that on
18 some sort of general dollar per ton of carbon and
19 what that cost would be generally, so it's more
20 of a societal benefit.

21 CHAIRMAN GOLDNER: Okay. So I think
22 you said you were planning to spend 22.5 million,
23 and if you just look at the hard benefits, the

1 line losses, efficiency, demand reduction, and so
2 forth, how -- what would be the return on that
3 22.5 million in investment? Is that 50 million
4 or 100 million, or what would that look like?

5 MS. SCHILLING: The benefit/cost we
6 have done to date, using -- again, using kind of
7 our experience in Massachusetts for a proxy of
8 benefits, since we haven't done it yet in New
9 Hampshire, is about a 1.2 to 1.4 benefit-to-cost
10 ratio, and that's over 20 years, discounted back.
11 So it's a 20-year MPV look. And so, if you were
12 to take the 22.5, you would probably see, over
13 the course of 20 years, probably close to \$30
14 million of benefit.

15 CHAIRMAN GOLDNER: Okay. So just said
16 differently, would it be true that the MPV of
17 that calculation, based on the hard benefits,
18 would be 40 million or something like that? Is
19 that an MPV calculation, roughly?

20 MS. SCHILLING: It is. It is. Yeah.

21 CHAIRMAN GOLDNER: Okay. Thank you.

22 Okay. Back to resiliency for a
23 moment. There's a -- sort of the premise for the

1 resiliency investments, at least sort of a
2 foundation piece of it, is this assertion that
3 storage is getting worse and so forth.

4 Is there any -- is there anything in
5 the filing that shows us that that's actually
6 what's happening?

7 DR. NTAKOU: So we have in the DSP,
8 you can find a section that talks about our
9 climate change vulnerability study, that shows
10 the intensification of weather because of climate
11 change, so it would show rising temperatures. It
12 would show increasing precipitation, as well as
13 flooding -- not here in New Hampshire. That's
14 primarily a problem in our other states, but
15 this -- this one part of the work that we have
16 done to show how the weather changes. And then
17 we do keep track of how many event days we get in
18 a year, what's the impact to our system, which
19 shows the intensity of each event, and that --
20 that is growing. It's not going down.

21 We could have less event days in a
22 year, which means less storms, but under the
23 hood, we'd see that each day is more impactful.

1 CHAIRMAN GOLDNER: Okay. What -- I
2 did see that portion in the filing. So I didn't
3 see the foundational study that the -- the study
4 that was done -- it's not in the filing that I
5 could see, so I would encourage the Company to
6 file that if they haven't already.

7 MS. NTAKOU: It's Bates 2156.

8 CHAIRMAN GOLDNER: But it's not -- the
9 study is not in there. Some of the pieces of the
10 study are inserted there, right, not the study
11 itself?

12 DR. NTAKOU: The result of the study
13 was done by an external consultant. It's just a
14 dashboard that you select a variable, and you get
15 those heat maps that we pasted in our DSP.

16 CHAIRMAN GOLDNER: Yeah. My
17 encouragement would be to go back, you know, 30,
18 50, 100 years, whatever -- whatever data you
19 have, and if -- if -- because if you're basing
20 the fact that you need significant resiliency
21 investments based on storms getting worse, then
22 you should have strong proof that the storms are
23 getting worse.

1 So my encouragement would be to go
2 back and look at history and help the Commission
3 understand that that premise or that assertion is
4 true, so --

5 DR. NTAKOU: Yeah, we can do that. We
6 provided in DOE 6110 a comparison of the SAIDI --
7 the all-in SAIDI for PSNH IEEE. So we set our
8 third quartile pretty much every year, compared
9 to a BlueSky SAIDI, where we set Q2 every year,
10 so we're -- we're at grade level, but we'll get
11 you some more data.

12 CHAIRMAN GOLDNER: Yeah. Thank you.

13 All right. I think I'm in pretty good
14 shape. Commissioner Chattopadhyay, do you have
15 any follow-on questions?

16 CMSR. CHATTOPADHYAY: Yes, I do.

17 So today's presentation, where the
18 2025-2029 capital investments were being shown
19 for the orange and the red categories, those are
20 actual projections, right, rather than just
21 being illusory?

22 MR. RENAUD: I'm sorry. I missed the
23 last part of your question.

1 CMSR. CHATTOPADHYAY: If you go to
2 that slide, which is Slide 19 in today's
3 presentation, the two portions which are in red
4 and orange or yellow, these are actual
5 projections, right? They're not just
6 placeholders?

7 MR. RENAUD: Correct. Is there
8 anything to add on that, Ms. Schilling?

9 MS. SCHILLING: No, we assumed those
10 were similar to the K-bar concept kind of caps,
11 so we would not plan to spend more than 35 in
12 total on those three different categories.

13 But if we could get the same benefit
14 for a lower cost, obviously, we would still just
15 -- just go with what we would need to get the
16 benefits as we articulated them.

17 CMSR. CHATTOPADHYAY: Because the PBR
18 is implemented sort of annually, those numbers, I
19 would expect them to be updated based on actual
20 spending, right?

21 MS. SCHILLING: Correct.

22 CMSR. CHATTOPADHYAY: And so right
23 now, what you have is a projection of what you

1 expect would happen over the five years?

2 MS. SCHILLING: Correct.

3 CMSR. CHATTOPADHYAY: Okay. This
4 question -- the next one is really trying to
5 understand, you know, the Utility's thinking
6 about having a solar project. If you think about
7 DER projects that happen privately -- let's talk
8 about northern -- the northern part of the state.
9 Has the Company explored possibility of working
10 with customers and, you know, creating the
11 ability to use their solar projects to help solve
12 some reliability problems? So, for example, you
13 could think about having a -- having a -- having
14 some sort of smart, you know -- I hesitate to
15 call it great, but sort of smart technology that
16 you can rely on. You can also have storage on
17 your own, but you work with the customers to get
18 value out of it, rather than just having a
19 project like the one you're talking about on your
20 own.

21 And I'm basically talking about --
22 just to expand a little bit on it, what I heard
23 in the morning was, those are driven by private

1 individuals. We don't have control over them.

2 Are there ways to work with them to
3 give you more control, and, therefore, help solve
4 some problems?

5 MR. FREEMAN: So, because part of this
6 is related to the DERMS and our ability to
7 orchestrate DER, I will let Ms. Schilling maybe
8 elaborate on that.

9 CMSR. CHATTOPADHYAY: Okay.

10 MS. SCHILLING: Yeah. Thanks for the
11 question, because I think it is important to
12 understand, you know, what it takes to be able to
13 leverage and use customer-owned distributed
14 energy resources as grid assets.

15 So the first thing that you need is
16 some mechanism to have real-time communication
17 and control. So we are starting to work with
18 customers, when they do an interconnection
19 agreement with us, to deploy equipment on their
20 side and our side that lets our real-time system
21 operators have the ability to kind of see
22 their -- their -- their facility in real-time.

23 And then, you know -- so once I have

1 that communication and control and I can send a
2 signal to say, either turn on or turn off, or
3 lower your output. So we have this ability to
4 communicate and have the ability to control.

5 Then the second thing that you need is
6 the DERMS, right, and the distribution management
7 system, which we already have, so our operators
8 know in real-time.

9 So let's say there was a capacity
10 constraint, and an operator in the control room
11 says, oh -- then the DMS lets them know, and they
12 say, okay, I'm seeing -- I'm seeing a potential
13 issue starting to happen on the distribution
14 system.

15 So then the DERMS says, okay, well,
16 there's a facility right there that, if you were
17 able to dispatch a battery, you could reduce
18 the -- the constraint on the system.

19 So it's the -- kind of the brain in
20 the control room that says, I know I have a
21 problem, and I know what resource is available to
22 be able to meet the need.

23 So then the only other thing you would

1 need, the third thing, is an agreement with the
2 customer to say, hey -- we wouldn't just control
3 a customer's facility without some sort of
4 operating agreement that gave us the ability to
5 do so. So that third part turns into, you know,
6 how we would be able to come to agreement with a
7 customer to do what you said, which is to use
8 their facility as a grid asset. That may involve
9 some compensation. It may -- you know, it just
10 depends on the terms of how we deal with a
11 customer.

12 We aren't including any of the first
13 or the third in this proposal, because we
14 consider the DERMS as a foundational investment
15 enabling the use of customer-owned assets as grid
16 resources. But, as I said, the communication and
17 control is something that we're starting to
18 require going forward, and then, you know, we
19 would just have to work with customers on the
20 third part.

21 CMSR. CHATTOPADHYAY: Do you already
22 do that in the other jurisdictions, like the two
23 other pieces?

1 MS. SCHILLING: Yeah. In
2 Massachusetts, we're also just starting to
3 require that first part, the communication and
4 control, but we do not have any customer-owned
5 facilities right now that have any operating
6 agreements where we can remotely communicate and
7 control with them.

8 We have DERMS projects underway in
9 western Mass., and planned for eastern Mass., so
10 the DERMS technology is kind of in its early
11 stages in Massachusetts. So we're just starting
12 to get up to speed on implementing all three
13 parts of it.

14 I would say, in Massachusetts, we have
15 proposed a Grid Services Compensation Fund to be
16 able to compensate customers for the use of their
17 assets as grid resources. That is still under a
18 lot of review and discussion in terms of the
19 level of how much compensation, what's there, how
20 do we tie that back to benefit on the grid, kind
21 of getting back to your benefit/cost analysis,
22 right? What's a fair level of compensation
23 that's commensurate with the benefits that

1 they're delivering to the distribution system?

2 So -- but Massachusetts is the place
3 where we're kind of on a roadmap to get to a
4 place where we can leverage customer-owned assets
5 as grid resources.

6 CMSR. CHATTOPADHYAY: And that is not
7 the case in Connecticut?

8 MS. SCHILLING: No. We do not have
9 the -- we do not have, right now, a plan for a --
10 either a distribution management system or a
11 DERMS system that's kind of funded, where they're
12 a little bit farther down on the roadmap, yeah.

13 CMSR. CHATTOPADHYAY: As for
14 Massachusetts, do you have a sense of when you'll
15 have the ability to do all the things, one, two
16 three? Like, you know, you're in the process of
17 enabling that, but do you have a sense when --
18 when you will ultimately be able to do
19 everything?

20 MS. SCHILLING: We'll have full DERMS
21 deployed across Massachusetts in 2027, so -- and
22 the -- assuming everything continues to move
23 forward with the Grid Services Compensation Fund,

1 I would say, in the latter part of 2027, we would
2 be starting to actually deploy the assets as grid
3 resources. So it's probably a couple years out
4 before we're actually in operation.

5 CMSR. CHATTOPADHYAY: So in New
6 Hampshire, if I understand you, DERMS is not yet
7 in place, but -- or is it?

8 MS. SCHILLING: I'm sorry. Could you
9 repeat the question? I couldn't hear.

10 CMSR. CHATTOPADHYAY: DERMS, is that
11 in place in New Hampshire, or it's gonna be in
12 place based on the capital expenditure that you
13 just talked about in the near future, or -- you
14 know, not necessarily near future, but the next
15 few years if you were allowed to do that?

16 MS. SCHILLING: Right. It's included
17 in the -- in the red part here in the 35.

18 CMSR CHATTOPADHYAY: Okay.

19 MS. SCHILLING: So the DERMS
20 investment is something that we included in the
21 ask. The plan right now is it would be towards
22 the latter end of the five-year time horizon. So
23 the plan would be, right now, that it wouldn't be

1 in service until the -- probably the end of the
2 five-year term, but that -- that's subject to
3 kind of the need and the cost/benefit analysis.
4 But the dollars -- the 8.5 million is included in
5 the incremental grid mod program.

6 CMSR. CHATTOPADHYAY: Yeah, I
7 understand your answer. I'm just -- I'm not sure
8 why this would take that long, so -- and I can
9 just leave it at that. And still, I don't
10 understand why it's going to happen at the end of
11 the, you know, five-year period or four-year
12 period that is shown here. I know there are --

13 MS. SCHILLING: Yeah. No, that's --
14 yeah, totally fair. Totally fair. We -- we were
15 kind of trying to time it relative to, you know,
16 some of the projections. As we're starting to
17 see more DER on the system, that that would --
18 you know, the benefit of it would be greater when
19 there is more DER to control. But the technology
20 is here today. We could -- you know, we could
21 start a lot sooner if that -- I think, if the --
22 you know, kind of our stakeholders and the folks
23 that are, you know, interested in participating,

1 there's nothing holding us back technically from
2 doing it sooner. It was more just trying to --
3 to match it to the timing of having more DER on
4 the system.

5 CMSR. CHATTOPADHYAY: Okay. My last
6 question is, as I was reading the testimony and
7 it's -- it's always fun to see that five -- five
8 experts are writing a testimony. That way, I
9 know I don't have to read the first ten pages, so
10 it makes it easier. I'm kidding, of course.

11 So one of the things that jumped at me
12 was, you have a substation that tends to cater to
13 Unitil, right?

14 MR. FREEMAN: Yes, we do.

15 CMSR. CHATTOPADHYAY: And how do you
16 recover the costs for those? Like, is it
17 Unitil's -- you charge Unitil for it?

18 How does that work out? I'm just
19 trying to make sure it's not the Eversource
20 ratepayers paying for something that Unitil
21 ratepayers are benefiting from.

22 MR. FREEMAN: I'll defer to Mr. Dickie
23 for this.

1 MR. DICKIE: Brian Dickie, Vice
2 President of System Operations.

3 Yeah, so Unitil has an X plus B
4 calculation that they use for peak load, and
5 that's how they get charged. In the interim,
6 they -- they put in a couple 115 to 34 stations,
7 so they've offloaded some of our system onto
8 their own, but they still do the calculations
9 on -- on the transformers.

10 CMSR. CHATTOPADHYAY: So it's fair to
11 assume that that substation, whatever the costs,
12 are being picked up by Unitil?

13 MR. DICKIE: Some, not all of it.
14 It's shared, right?

15 CMSR. CHATTOPADHYAY: Sure. I'm
16 talking about the shared.

17 MR. DICKIE: Yeah, it's shared. They
18 pick up their portion of it.

19 CMSR. CHATTOPADHYAY: Yeah.

20 MR. DICKIE: That's correct.

21 CMSR. CHATTOPADHYAY: That's all I
22 have.

23 CHAIRMAN GOLDNER: I have one last

1 clean-up with Mr. Freeman. We had talked before
2 the break about solar examples of customers that
3 were close and far away, and what did the costs
4 look like between the development -- developer
5 and the Company.

6 MR. FREEMAN: Sure, Chairman.

7 So we looked over the past three years
8 at the solar projects, the ground-mounted
9 projects that are over 100 kilowatts and that
10 have received interconnection agreements.

11 I have 16 of them. They range in cost
12 from \$1,000 to \$2.2 million at the high end, so
13 average about \$430,000. And the cost per
14 kilowatt is \$280, and that's important to note
15 because in -- in other jurisdictions, we have
16 conducted studies of what solar developers are
17 willing to pay us for cost of interconnection,
18 and the consensus was \$500 per kilowatt or less
19 was their break-even point. So \$280 per kilowatt
20 is the average that New Hampshire projects have
21 paid over the last three years.

22 CHAIRMAN GOLDNER: And I don't know if
23 you were able to get it or not, but if you could

1 just give us an example of each extreme, you
2 know, what was kind of the minimum cost to the
3 developer. I think you might have just said
4 \$1,000.

5 MR. FREEMAN: \$1,000, yeah.

6 CHAIRMAN GOLDNER: And then the
7 maximum cost to developers is 2.2; is that right?

8 MR. FREEMAN: 2.2 million. And for
9 that project, we had to run on top of the circuit
10 line to interconnect that project, and so the
11 cost was for the distribution feeders.

12 CHAIRMAN GOLDNER: Okay. And then
13 what was the Company cost in those two examples?

14 MR. FREEMAN: That was actually the
15 cost for the Company to do that, and the
16 developers paid.

17 CHAIRMAN GOLDNER: I see, so --

18 MR. FREEMAN: It was a Kayak -- it was
19 Kayak developers.

20 CHAIRMAN GOLDNER: So the developers
21 paid 100 percent?

22 MR. FREEMAN: Yes, contribution in for
23 -- yes.

1 CHAIRMAN GOLDNER: And is that true in
2 every example? Was it always that the developers
3 paid 100 percent?

4 MR. FREEMAN: For all solar projects,
5 the developer pays 100 percent of the cost to
6 interconnect.

7 CHAIRMAN GOLDNER: Okay. Via Kayak.
8 Okay. All right. Thank you for the follow-up on
9 that one.

10 MR. FREEMAN: You're welcome.

11 CHAIRMAN GOLDNER: And now I'll just
12 turn to the participants today to see if anyone
13 has questions for the Company.

14 MR. DEXTER: I just have one or two
15 questions.

16 As a result of the last rate case, the
17 Company undertook a business process audit, and
18 my question to the Company is: Did the business
19 process audit impact any of the DSP, the
20 distribution system planning that we talked about
21 today, and if so, could you please describe how?

22 MR. FREEMAN: So the business process
23 audit included several recommendations by the

1 consultants for how to improve accounting
2 practices, how to improve coordination between
3 system planning and distribution engineering,
4 tools to deploy, building models, and they're
5 really aligned with a lot of practices that we
6 were already implementing. We do a lot to
7 advance planning practices with regard to how we
8 develop processes for maintaining models and
9 updating models with distribution engineering.

10 So I would say that the DSP really
11 takes into account the spirit of a lot of what
12 the consultants recommended, because we're
13 already on the way to defining these
14 capabilities, and most of the capabilities were
15 already represented in our planning process. We
16 have -- I can say that we have taken them into
17 account, but not per se as a result of the audit,
18 since we were already on the way to developing
19 many of those practices.

20 MS. BOTELHO: If I could just add, so
21 where the Company is in the process of responding
22 to this exact question from the DOE, and DOE's at
23 7141, so we have not yet filed it with the DOE,

1 but we go through a detailed review of each
2 recommendation outlined from the business process
3 audit and how we responded.

4 MR. DEXTER: Mr. Dudley would like to
5 ask a question, please.

6 MR. DUDLEY: Thank you, Mr. Dexter.

7 Given that over the last several
8 years, Eversource has consistently met their
9 reliability targets, I'm trying to understand the
10 escalation and reliability spending if Eversource
11 is meeting most of its reliability targets.

12 MR. RENAUD: Yeah, I will start --
13 take that. You know, part of -- part of what
14 we're looking at are the age and performance and
15 obsolescence of our equipment. We anticipate
16 because of that, in order to maintain, you know,
17 a level of reliability and level of reliability
18 indices, we -- if we were spending at the same
19 level, we would start to see increasing failures
20 and expect that. We don't want that. And so we
21 are -- anticipate, through what we've described
22 in the plan here, an accelerated replacement to
23 catch up with the age and -- and obsolescence of

1 the equipment.

2 So that really is looking at future
3 performance and probabilities of failure, as
4 opposed to just strictly looking at what the
5 performance has been in the past.

6 MR. DUDLEY: But at the level of the
7 spending, it -- it appears to us that asset
8 condition is prolific throughout Eversource's
9 service territory, but -- is that the case?

10 MR. RENAUD: It is. I -- when you
11 look at age profiles of transformers, poles and
12 those types of equipment, you'll see that we are
13 behind, based on industry standard, lives that we
14 anticipate. So we don't want -- we don't want to
15 get to a point where we're seeing failures. We
16 went to get ahead of that.

17 And as well as, in order to improve
18 reliability, circuit ties is a big piece of what
19 we're doing. It is -- we have a lot of
20 long-range lines that -- as we described.

21 So part of the plan, in order to
22 mitigate, you know, even the randomness of
23 outages, we're not strictly looking at exactly

1 where outages happened before. We want to make
2 sure we're planning to be able to back up part of
3 a system that we can't back up today.

4 MR. DUDLEY: But if asset condition
5 were that critical, your SAIDI, SAIFI, CAIDI
6 numbers would -- would be down, correct?

7 MR. RENAUD: Well, it might -- it
8 might be that things start to fail faster than we
9 can -- than we can get to them, and we don't want
10 to put ourselves in that position. If we have a
11 couple of transformer failures over a five-year
12 period, and we start to see, you know, just to
13 throw numbers out, five or ten in that same
14 period going forward, because of -- because of
15 the profiles, we wouldn't want to be in a
16 position where we were trying to scramble at that
17 point to fix that, at the expense of a customer
18 being out of service.

19 MR. DUDLEY: So would you characterize
20 Eversource's asset condition as critical?

21 MR. RENAUD: Well, I wouldn't say
22 critical, but we are at a point where we feel
23 investment's necessary so we don't get to a

1 critical point.

2 MR. DUDLEY: Okay. I'm just trying to
3 square that, Mr. Chairman, with the level of
4 spending.

5 CHAIRMAN GOLDNER: Thank you,
6 Mr. Dudley.

7 MR. DUDLEY: That's all I have. Thank
8 you.

9 CHAIRMAN GOLDNER: Thank you. Very
10 helpful.

11 Any other questions from the
12 participants today?

13 MR. DEXTER: I wanted to check with
14 Mr. Crowley on the stage --

15 CHAIRMAN GOLDNER: Sure.

16 MR. DEXTER: -- on the screen, please.

17 MR. CROWLEY: I don't have any
18 questions now. I will have some questions on
19 Thursday, but I think I'm good today.

20 MR. DEXTER: Thank you.

21 CHAIRMAN GOLDNER: Thank you, Attorney
22 Dexter.

23 Attorney Kreis?

1 MR. KREIS: Thank you, Mr. Chairman.
2 I don't want to get into a big back-and-forth
3 with the Company, because, as I've already said,
4 I have a raft of procedural concerns with giving
5 the Company this golden opportunity to pre-try
6 its case, but I did want to satisfy my curiosity
7 about something.

8 Back -- back, I think it was in July,
9 I got a press release from a Company named Piclo,
10 P-i-c-l-o, and it was announcing what it called
11 the First Online Grid Flexibility Marketplace in
12 Connecticut, and said that, for the upcoming
13 winter, it was working with both Eversource and
14 United Illuminating to procure roughly 35
15 megawatts of energy flexibility, and compensate
16 participants who support the grid and improve
17 reliability, et cetera, et cetera, et cetera.

18 I don't want to read the whole press
19 release, but I'm just curious whether -- I am
20 guilty of multitasking, I apologize, but I didn't
21 hear Eversource mention that project down in
22 Connecticut, and I wonder if somebody from
23 Eversource could talk a little bit about it and

1 whether anything like that could ever happen here
2 in New Hampshire.

3 MS. SCHILLING: Yeah. Sure. Thanks
4 for the question. I can take -- I can take that.

5 So, yeah. No, your -- your
6 description of the Piclo project in Connecticut
7 was accurate and good. The genesis of that is a
8 program in Connecticut called Innovative Energy
9 Solutions, and the Connecticut -- the Public
10 Utility Regulatory Authority, PURA, in
11 Connecticut runs a process where -- what they're
12 looking for is innovative solutions where
13 companies like Piclo can work either with
14 utilities or by themselves to implement, you
15 know, programs on the grid to, in this case,
16 reduce demand. So they were looking for
17 companies that would be willing to kind of run a
18 program in Connecticut to reduce demand on the
19 system.

20 So in this particular project, the --
21 Piclo presented a concept that said, for winter,
22 we can run a -- it's essentially like an auction.
23 So they go out, and they recruit what they call

1 flexible service providers, so like an EV charger
2 or, you know, an aggregated behind-the-meter
3 demand response program, and just bid into this
4 platform.

5 And then -- and then the ones that are
6 kind of selected based on getting the lowest cost
7 for the resource are ones that then, in an event
8 in the winter -- to reduce winter peak, we will
9 call on these resources. They will -- if they
10 show up -- if they actually reduce demands the
11 way that they had committed to do, then they get
12 paid. So it's a -- it's kind of an auction
13 concept to get the lowest cost demand response
14 possible.

15 As Eversource, we worked with Piclo.
16 We helped them identify locations where said
17 demand response would be potentially valuable to
18 the system, and we're kind of walking with them
19 through the process to -- to be able to recruit
20 customers, to educate them on what the program
21 is, and then we're helping -- they're doing the
22 measurement and verification at the end of the
23 day. So the funding for the program comes

1 from -- it's a PURA program, and it's -- the
2 funding comes through the PURA program.

3 I would say, as I mentioned, I think
4 there was a question earlier about kind of the
5 state of Connecticut relative to the DERMS and
6 the DMS, and so Connecticut lags in the
7 technology front on those -- you know, with
8 respect to our ability to see this in real-time.

9 So the program is -- you know, we're
10 gonna -- we're gonna use it as a way to see -- to
11 try and understand better, if we ask 100 people
12 to participate, how much response we actually
13 get. So it's a good learning experience for us,
14 both on what is the price that we need to be
15 paying customers to show up, and then, when we do
16 agree with the customers, how much do they
17 actually show up in the end of the day.

18 So that's kind of our benefit of
19 participating in a program. Without direct
20 communication and control of these assets, we're
21 less -- you know, it's a little more difficult
22 for us to be able to count on them actually
23 showing up. But we're using it as a good

1 learning experience. Combined with the DERMS, a
2 Piclo program can be a good way to try and get
3 the lowest cost resource by having folks bid to
4 compete to provide the services that we need.

5 And then -- so once we have the DERMS,
6 this would be -- Connecticut would be another
7 place where we could use that type of recruiting
8 tool and then be able to count on it, because we
9 know we have real-time visibility into their
10 responsiveness.

11 MR. KREIS: Well, Ms. Schilling, you
12 don't have to thank me for asking you a softball
13 question like that. But I am curious whether you
14 foresee anything like that happening here in New
15 Hampshire.

16 MS. SCHILLING: Oh, absolutely. I
17 think the foundation -- the combination of our
18 system operators being able to have real-time
19 visibility of what's going on of a price
20 responsive load and finding the most
21 cost-effective way to get the resources, it's a
22 -- it's a good combination, and we're learning a
23 lot in the Piclo process in Connecticut, and

1 that's -- you know, that's one thing we endeavor
2 to do, use best practices and bring them, you
3 know, wherever it makes sense.

4 So I think that's -- you know, I do
5 think that's a -- it's a potential program --
6 obviously, it needs the -- right now in
7 Connecticut, it's funded through PURA. All
8 customers are paying the fees for the -- for the
9 participation, so that would need to be part of
10 it, but I think it's -- if it's successful in
11 Connecticut, it's something we would want to
12 explore in other places as well.

13 MR. KREIS: Groovy. That's all I
14 wanted to ask about, Mr. Chairman.

15 CHAIRMAN GOLDNER: Thank you. Any
16 other questions from the participants?

17 MR. KRAKOFF: Thank you. I have a few
18 questions for the participants.

19 I guess the first question was
20 following up on a couple Commission questions.
21 It was on a co-optimization project, which
22 results in the annual K-bar adjustment.

23 I think previously you said that you

1 do not do prudence -- that a prudence review
2 would not be conducted through that annual K-bar
3 adjustment, and that that would occur later on in
4 the subsequent rate case.

5 So I -- I guess my question for you
6 is, if there is an adjustment to the K-bar during
7 each annual review, then they do a prudence
8 review later on during the subsequent rate case,
9 is there a potential for a natural result in a
10 downward adjustment of the K-bar if the
11 Commission determines that the project is not
12 prudent?

13 MR. HORTON: I can certainly take
14 that. As it relates to the co-optimization
15 investments, Commissioner Chattopadhyay had
16 asked, you know, could there be a separate
17 process. So, putting that aside, is there a
18 process to evaluate for prudence prior to moving
19 forward, which we had committed to taking back.

20 The idea of the K-bar is that you
21 wouldn't be having to or trying to engage in an
22 annual prudence review, which was one of the
23 benefits that we see of the K-bar as compared to

1 other regulatory frameworks, whether it be a
2 capital tracker, a targeted capital tracker, step
3 adjustments, something that, generally, in the
4 past had required that prudency review annually.

5 So the structure of K-bar is that the
6 prudency review would take place in the next rate
7 case, and then would result in a prospective
8 adjustment, just like if -- in the course of this
9 rate case, if all of the capital documentation
10 that we've submitted and is being reviewed, if
11 any one of those projects is found to be
12 imprudent, it wouldn't result in a change going
13 back in time. It would result in a change to the
14 authorized revenue requirement coming out of this
15 proceeding, which would apply prospectively. And
16 that would be -- that was the base idea.

17 We were asked to consider if there's a
18 way, for valid reasons, to put some structure
19 around the co-optimization, and there certainly
20 are. We hadn't put that into our original
21 proposal, but now understanding that, I guess,
22 blind spot, if you will, that I hadn't
23 anticipated, we certainly can attempt to resolve

1 that, such that if the prudency review for
2 certain types of projects that we're talking
3 about, like co-optimization, were to happen in
4 real-time, adjustments would take place in
5 real-time. But that wasn't -- that is not the
6 idea of the K-bar, to have a prudency review
7 along the way.

8 MR. KRAKOFF: So, I mean, I guess -- I
9 mean, I thought before, you said you would adjust
10 the K-bar during each annual review, right?

11 MR. HORTON: Yes. So the K-bar will
12 go into effect each year. And, again, the
13 co-optimization, this is an important discussion,
14 but it really is like an exception, in that we
15 see few of these projects coming our way. We
16 have two on our radar screens right now, so it is
17 not extensive. This is not a major driver, as we
18 look ahead. It's still something to address.

19 So what we were proposing is that, for
20 the K-bar itself, the base operation of it, there
21 would be an annual adjustment based on actual
22 plant additions. And that annual adjustment
23 wouldn't require a full prudency review of all

1 the additions, because it's providing us revenue
2 support for capital expenditures along the way.
3 That's the base framework of the K-bar.

4 We wouldn't be expecting to or
5 advocating that there be a prudency review for
6 each, you know, addition made along the way.
7 What we are talking about, though, is for the
8 carve-out for co-optimization, the way that we
9 had originally proposed it, also would not have
10 required a prudency review. But based on the
11 questioning today and the concerns that have been
12 raised, that is one way that we could envision
13 solving, the fact that the way we had proposed it
14 would essentially allow for, you know, us to -- I
15 think it was -- it would allow us to come in with
16 an extremely large project without giving the
17 Commission an opportunity to opine before we
18 moved ahead.

19 That wasn't our intention, and I think
20 a prudency review would be a way to solve for
21 that for co-optimization investments.

22 MR. KRAKOFF: Okay. So I mean, I
23 think it sounds like you're going to reconsider

1 your initial proposal based on the conversation
2 today?

3 MR. HORTON: My understanding is,
4 based on conversation today and last week, yes,
5 there are several follow-up questions that we're
6 expecting to respond to in writing, and that was
7 one of them.

8 MR. KRAKOFF: Thanks. And just a
9 couple of other questions. I guess it was with
10 respect to slide -- bear with me one second.
11 Slide 15, and it was when you talked a little bit
12 about, you know, non-wires alternatives, and how
13 you do that cost/benefit analysis on NWAs.

14 I don't think you talked about it
15 today, or if you did, I didn't hear you. But
16 could you point me to where in the filings -- you
17 know, you've listed out the benefits that you're
18 using to measure the benefits when you do that
19 cost/benefit analysis for NWAs.

20 DR. WALKER: We'll have to take that
21 as an action and find the exact location. I
22 don't know that off the top of my head.

23 But I can quickly talk a little bit

1 about the benefits that are being used in the
2 non-wired approach.

3 MR. KRAKOFF: That would be great.

4 DR. WALKER: Yeah. So as the Company
5 has mentioned in its filing, we have a non-wired
6 alternative framework that outlines how the
7 Company reviews alternatives to traditional
8 investment. Now, this can be energy efficiency,
9 storage, solar, spot generation, demand --
10 there's a whole lot of opportunity there. And we
11 don't limit this to any technology or just one
12 technology. I mean, a mix thereof is also
13 possible.

14 And the first screen all of this must
15 pass is a technical feasibility test, and no
16 solution is going to be considered that doesn't
17 address the need. If we're talking about a
18 ten-year forecast and we have X amount of
19 capacity, means any solution considered must meet
20 that reliably.

21 And the second point that was just
22 addressed is, what do we do in terms of the
23 benefit/cost analysis. So the biggest driver on

1 the benefits side for non-wired solutions for the
2 customers is the deferral on the investment of
3 the infrastructure.

4 So rather than, as an example,
5 upgrading a substation in the next two years, you
6 can deploy a program with an array of different
7 technologies that pushes that out. Let's call it
8 eight years. That defers that investment. That
9 has an impact on the revenue requirement of the
10 customer. We can calculate that benefit, and
11 that is basically the largest benefit that sits
12 against the cost of the solution.

13 If the solution, for example, includes
14 solar, there are certain benefits for the
15 generated energy that gets counted in towards it.
16 If it is storage, we typically do not consider
17 benefits from energy markets in the initial
18 benefit/cost analysis. It's highly speculative
19 on a ten-year horizon to predict how much benefit
20 the storage system might get to actually make.
21 And the dispatch for non-wires is not always in
22 line with what energy markets might need, too.
23 We all have conflicting interests, which we can't

1 really have for a distribution asset.

2 So we don't typically consider that.
3 Should those then actually end up producing some
4 value, that's, of course, directly calculated
5 against the cost of the non-wired solution, and
6 drives down the cost to the ratepayers.

7 Yeah, but that -- that basically
8 summarizes it. So we do evaluate the markets.
9 We don't put that into the BCA. We look at the
10 deferral value of the traditional solution, and
11 that's what has to be offset by the cost. I hope
12 that helps.

13 MR. KRAKOFF: Yeah, I think so. But
14 to follow up on that, I mean, would you account
15 for any cost related to -- any cost-related
16 siting differences between the two projects? So,
17 you know, I guess, not simply cost, but the
18 difficulty --

19 DR. WALKER: Of course. So the
20 projects include costs. When I do the
21 evaluation, there's a cost assumption to
22 procuring property, siting challenges. All of
23 that goes into the calculation. So by the time

1 we do the benefit/cost analysis, we typically
2 have a relatively good understanding of what the
3 traditional solution costs.

4 And for the non-wires, we start off
5 with standard values from, for example, NREL,
6 National Renewable Energy Laboratory, and then we
7 can get more detailed and more detailed, down to
8 the point that if we decide to do this, we can
9 issue an RFP to see, for example, the volume
10 storage, what the cost of such a solution would
11 finally turn out to be.

12 And that -- that includes all the
13 siting, land procurement, interconnection costs
14 and everything that's associated with it.

15 MR. KRAKOFF: And I think before, you
16 said you solicit some NWA's in Massachusetts, and
17 I think you said Connecticut as well -- or you
18 were planning to.

19 Did you issue RFPs in those cases?

20 DR. WALKER: So that depends on where
21 those projects are in the state of development,
22 right? Mr. Freeman had mentioned in Connecticut
23 the currently filed with the Commission. So as

1 soon as they get approved, then that would be the
2 logical next step.

3 I don't know where we are in
4 Massachusetts with the two. For P-Town, I am
5 fairly certainly that we did, yes. Those were
6 procured through an RFP.

7 MR. FREEMAN: Correct. And the one
8 that's in development in Massachusetts, that one
9 we -- that one is issued to -- to a contractor
10 based on embeds. I think it was an RFP, also.
11 The second one is not at the RFP stage yet. And
12 as Mr. Walker mentioned -- Dr. Walker -- the
13 Connecticut projects will go through the same
14 process as we did in P-Town.

15 I just want to note that the non-wires
16 are not too frequent, that Dr. Walker described.
17 That has been filed in previous dockets in New
18 Hampshire. We have filed it in this docket, if
19 it's helpful. There is a docket in that sphere
20 that outlines everything that was just described.

21 MR. KRAKOFF: And just one or two
22 follow-up questions. Before, you said that
23 basically -- if the benefit/cost ratio is over

1 one, you selected -- I guess when you're
2 comparing traditional to the non-wires -- it's
3 just going with the higher BCR?

4 DR. WALKER: Well --

5 MR. KRAKOFF: Or is it not that
6 simple?

7 DR. WALKER: Yeah, it's not quite that
8 simple. I guess the first thing it needs to pass
9 is the technical screening, all right? We're not
10 going to take a look at the BCR if we're not sure
11 the solution can pass the technical side, because
12 a cheaper solution that's less reliable isn't
13 something that we're going to be looking for.

14 And then even if it passes the BCA or
15 BCR, greater one, you still have to go through
16 RFP, and, you know, our estimate might have been
17 wrong. The vendors might have come back with
18 significantly higher bids that might still fail
19 at that point.

20 So there's multiple checks in there to
21 make sure that the solution we're progressing
22 with is the most cost beneficial solution, should
23 we go down the route of the non-wires.

1 MR. KRAKOFF: Okay. Thank you. Those
2 are all my questions.

3 CHAIRMAN GOLDNER: Okay. Just
4 checking one more time. Anything else?

5 Okay. Seeing none. I'll thank
6 everyone for their participation today, and for
7 the Company, we appreciate bringing both the
8 technical experts and the executives to this --
9 to this session. I think we had the right people
10 here to get the questions answered for this
11 Pre-Hearing Technical Conference.

12 And this concludes day 3, having had
13 all our PBR questions answered. We'll cancel day
14 4 for tomorrow, and thank everyone for their
15 time, and this Pre-Hearing Technical Conference
16 is adjourned. Thank you.

17 (Whereupon, the proceeding
18 was concluded at 2:00 p.m.)

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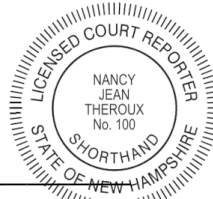
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