Orange & Rockland

Customer-Owned Street Light Dimming Pilot
Collaborative Meeting Transcript
Thursday, March 23, 2023

Meeting Participants

- O&R
  - Jacqueline Frosco
  - Karleigh Murphy-Rodriguez
  - Vinson Jones
  - Richard Sullivan
  - John L. Carley
  - Janette Espino
  - Trish Austin
  - Matthew D. Mariconi
  - Eric Caban
  - Kelly Rolo
  - Chris Gonzales
  - Cheryl Ruggiero
  - Keith Scerbo
  - Theresa Manera-Mason
- NYPA
  - Charles Hermann
  - David Maya
  - Christine Spear
  - Nathan Markey
- Guth DeConzo
  - Bou Reed
- DPS
  - Tanya Dugal
  - Craig Carroll
  - Anthony Mannarino
  - Tessie Mar
  - Johanna Miller
  - Brian Fisher
  - Sandra Sweet
- Orangetown
  - Allison Kardon
- Middletown
  - Jacob Tawil
- Clarkstown
  - Robert Berdy
- Warwick
  - Mike Sweeton
- Nyack
  - Andy Stewart
- ScottMadden
  - Jonathan Aronoff
  - Kevin Hernandez

0:16:32.470 --> 0:16:35.180
Jonathan Aronoff
Hi, everyone. Good morning. Thank you for joining.

0:16:35.850 --> 0:16:44.210
Jonathan Aronoff
Going to be giving folks a couple more minutes to log in and then we will get started at about 1004.

0:19:21.530 --> 0:19:28.440
Jonathan Aronoff
Good morning, everyone. Who is joining us. We're going to give folks one more minute and then we will get started.

0:21:1.570 --> 0:21:29.850
Frosco, Jacqueline
OK. Good morning, everyone. Thank you for joining us this morning. I'm Jackie Frosco, director of new business services with Orange and Rockland. Joining me this morning in a few moments will be our Vice President of customer operations, Janet Espino, and would like to extend a warm welcome to our valued

partners from the Department of Public Service, DPS staff and the New York Power Authority, NYPA, as well as our valued customers and Orangetown Nyack.

0:21:29.940 --> 0:21:37.870
Frosco, Jacqueline
Warwick, Clarkstown, Middletown and others. We truly appreciate your partnership, support and engagement in this pilot.

0:21:38.580 --> 0:22:4.100
Frosco, Jacqueline
Today's meeting is a critical milestone in our ongoing work to support our customers and our other valuable stakeholders to navigate the impacts and benefits of emerging technologies and energy saving opportunities. Today, we are going to walk through the background and concepts behind the customer owned street light dimming pilot will walk through the pilot results and then discuss our findings and especially next steps.

0:22:4.940 --> 0:22:23.590
Frosco, Jacqueline
Before we get started with this meeting, as always, the companies commitment to safety, we'll start with the safety message. So today's theme is regarding situational awareness and maintaining a steadfast focus on our environmental surroundings. This is also in the office, especially as we begin to transition.

0:22:24.230 --> 0:22:48.730
Frosco, Jacqueline
And definitely want to call out when driving as the change of seasons are upon us as well. We do have some folks attending here in the auditorium with us in Spring Valley, so at this point I would like to just point out in the event of an emergency, I draw your attention to the exits. There are two one at the stage side of the auditorium and then the other at the entrance. Please follow the exit signs.

0:22:49.210 --> 0:23:2.470
Frosco, Jacqueline
Umm, exit into our areas and then exterior to the building into the parking lot areas and there you'll have directions. So thank you. With that I'm gonna hand it off to our facilitator for this morning's meeting. Jonathan Aronoff.

0:23:4.840 --> 0:23:5.960
Frosco, Jacqueline
Good morning, everyone.

0:23:4.810 --> 0:23:6.500
Jonathan Aronoff
Good morning, everyone.

0:23:7.530 --> 0:23:9.960
Frosco, Jacqueline
So if you housekeeping note before we get started.

0:23:7.610 --> 0:23:16.520
Jonathan Aronoff

So a few housekeeping notes before we get started at anytime during the meeting. Please feel free to submit questions or comments using the Q&A feature.

0:23:10.790 --> 0:23:16.540
Frosco, Jacqueline
At anytime during the meeting, please feel free to submit questions or comments using the Q&A feature.

0:23:17.770 --> 0:23:18.850
Frosco, Jacqueline
Toward the end of each section.

0:23:17.760 --> 0:23:23.40
Jonathan Aronoff
Toward the end of each section will reserve time to read out an answer, any clarifying questions.

0:23:23.940 --> 0:23:30.930
Jonathan Aronoff
You can also use the Q&A feature to let us know if you're experiencing any technical difficulties and we will do our best to address those.

0:23:33.500 --> 0:23:39.50
Jonathan Aronoff
This meeting is being recorded. We will be submitting a transcript as part of the filing for this matter.

0:23:40.20 --> 0:23:43.310
Jonathan Aronoff
If you have any questions or comments after we finish.

0:23:44.70 --> 0:23:48.800
Jonathan Aronoff
Please reach out to Rich Sullivan at Onar. His e-mail is displayed here.

0:23:50.140 --> 0:23:52.100
Jonathan Aronoff
With that, I will hand it back to Jackie.

0:24:15.300 --> 0:24:18.550
Frosco, Jacqueline
OK, here we go. Everyone can hear me now. Yes. OK. Wonderful.

0:24:22.810 --> 0:24:48.640
Frosco, Jacqueline
OK. There we go. OK. So I'd like to introduce our presenters and our meeting participants. So this morning we have with us, Jack Carley, our General counsel. We have our general manager from customer metering and technology operations, Keith Scerbo, representing our new business department section manager, Carley Murphy Rodriguez, senior specialist Rich Sullivan and project manager Vinny.

0:24:49.730 --> 0:25:5.220
Frosco, Jacqueline
Vinny. OK. I'm Cheryl Ruggerio and Erica banned from rate engineering. Chris Gonzales are principal

engineer from distribution engineering from our regulatory and Public affairs group. We have Trish Austin, Kelly, Rolo and Matt Marconi.

0:25:6.790 --> 0:25:26.70
Frosco, Jacqueline
From NYPA we have with us Charles Hermann, David Maya. Christine Speer, I believe, is with us. Nathan, Marco and Bou Reed. Their consultant engineer with Guth de Kanza. Let me just pause there. Is there anyone else from NYPA that would like to be announced at this point?

0:25:29.370 --> 0:25:37.690
Frosco, Jacqueline
OK from DPS staff, thank you for joining. We have Tanya Dugal, Brian Fisher, Craig Carroll.

0:25:38.420 --> 0:25:45.540
Frosco, Jacqueline
Uh, Sandra sweet. Yes. Yes, thank you, Sandra. Anyone else from DPS staff at this point that would like to announce?

0:25:47.750 --> 0:25:55.440
Frosco, Jacqueline
OK, great. Welcome. And we are delighted to welcome with shrimp presenting the town of Orangetown, Allison Kardon.

0:25:56.290 --> 0:25:58.270
Frosco, Jacqueline
Village of Nyack Andy Stewart.

0:25:59.30 --> 0:26:1.150
Frosco, Jacqueline
Town of Warwick, Mike sweetened I, Mike.

0:26:1.900 --> 0:26:7.230
Frosco, Jacqueline
From the city of Middletown, Jacob, 12, and from the town of Clarkstown. Robert Bertie.

0:26:8.340 --> 0:26:15.210
Frosco, Jacqueline
OK. Again, I'm going to just pause. Is there anybody that would like to be announced that's in attendance this morning and we'll record?

0:26:18.600 --> 0:26:25.530
Frosco, Jacqueline
OK. Thank you. With that then, I'm going to turn it back over to Jonathan. He'll begin with our agenda and then we'll jump into the presentation. Thank you.

0:26:24.430 --> 0:26:25.610
Jonathan Aronoff
Citation. Thank you.

0:26:26.870 --> 0:26:27.750
Frosco, Jacqueline
Thank you, Jackie.

0:26:26.900 --> 0:26:27.780
Jonathan Aronoff
Thank you, Jackie.

0:26:28.740 --> 0:26:34.410
Frosco, Jacqueline
Will be providing an overview of the customer owned street light dimming pilot led by Carly Murphy.

0:26:28.760 --> 0:26:43.490
Jonathan Aronoff
Will be providing an overview of the customer owned street light dimming pilot led by Carly Murphy Rodriguez and Chuck Hermann. Then Rich Sullivan will provide a report on pilot outcomes and walk us through our findings and analysis.

0:26:44.620 --> 0:26:49.290
Jonathan Aronoff
Jackie will then facilitate our collaborative discussion on the key questions for the pilot.

0:26:50.440 --> 0:27:1.410
Jonathan Aronoff
Following that, we will break for about 30 minutes. We'll compile and synthesize the outcomes of our discussion, provide a recap, and then we will adjourn for the afternoon.

0:27:3.70 --> 0:27:8.530
Jonathan Aronoff
We'll now hand it over to Carley Murphy Rodriguez to lead us through the street light pilot overview.

0:27:12.680 --> 0:27:14.0
Murphy Rodriguez, Karleigh F
Morning. Thank you, Jonathan.

0:27:16.530 --> 0:27:17.290
Murphy Rodriguez, Karleigh F
Next slide please.

0:27:19.740 --> 0:27:39.590
Murphy Rodriguez, Karleigh F
So for some background on why we're here today, the PSC originally approved a customer owned LED Street light dimming pilot as part of O&R 2018 rate case due to pandemic delays and the resulting procurement issues the pilot was put on hold, we were able to restart the pilot implementation following our most recent rate case in 2021.

0:27:40.870 --> 0:28:4.540
Murphy Rodriguez, Karleigh F
The rate order directed O&R and NYPA to conduct the pilot and once we collected and analyzed the pilot

data to host this collaborative meeting with interested stakeholders to evaluate and discuss the outcomes and following today's meeting owner would develop and draft recommendations and file them with the PSC later this year. We will host a technical conference also as directed to further review the nodes and its technology.

0:28:5.530 --> 0:28:25.430
Murphy Rodriguez, Karleigh F
So what are the actual objectives of the pilot? First, it was to see if networked lighting controller nodes and I'll see nodes could function in place of revenue grade meters for customer owned St. lights and also to better understand whether NLC nodes can reduce electric usage through dimming and then assess the possible ways we could account for that reduced usage.

0:28:26.980 --> 0:28:27.690
Murphy Rodriguez, Karleigh F
Next slide please.

0:28:30.150 --> 0:29:0.750
Murphy Rodriguez, Karleigh F
Here's the timeline that we've been following to deliver on these objectives following the rate order in April of 2022, NYPA worked with the town of Orangetown to complete installation, programming, and troubleshooting for the NLC nodes on 23 St. lights and donor. We individually metered all 23 lights that had the NLC nodes, NYPA and O&R. Each collected usage data for the six month pilot period starting May 15th and concluding November 15th. Since then, we've been analyzing the data and developing our plan for this meeting.

0:29:1.220 --> 0:29:5.170
Murphy Rodriguez, Karleigh F
And following our meeting today, we will file recommendations in the second quarter of this year.

0:29:5.840 --> 0:29:9.500
Murphy Rodriguez, Karleigh F
And then we planned to host a technical conference by the end of July 2023.

0:29:10.510 --> 0:29:16.510
Murphy Rodriguez, Karleigh F
Now I'll hand it over to Chuck Hermann from NYPA to talk about the statewide St. Lighting initiative and the NLC nodes themselves.

0:29:17.800 --> 0:29:18.200
Murphy Rodriguez, Karleigh F
Chuck.

0:29:20.270 --> 0:29:21.600
Hermann, Charles
Morning. Can everyone hear me?

0:29:26.830 --> 0:29:28.420
Jonathan Aronoff
Looking back, yes, we can hear you, Jeff.

0:29:28.660 --> 0:29:29.940
Hermann, Charles
Alright, great. Thank you, Jonathan.

0:29:31.340 --> 0:30:0.60
Hermann, Charles
And thank you, Carley, for the introduction. The governor's office directed NYPA to participate in the New York State Smart Street lighting program in 2018 with the goal of converting 500,000 St. lights to LED by 2025. The goals overall were to reduce energy consumption and expand the use of smart street lighting technologies. And in that effort, NYPA provides financing to our customers.

0:30:0.140 --> 0:30:11.680
Hermann, Charles
As well as complete project implementation including procurement of the lights from the perspective utilities, design, procurement and construction to convert those existing lights to the new LED technology.

0:30:12.360 --> 0:30:27.230
Hermann, Charles
To date, our results include over 150 customers participating with us over 200,000 lights in the program. Approximately half of those are currently installed. The other half are in design and construction.

0:30:28.310 --> 0:30:58.540
Hermann, Charles
And over $340 million in total customer investments in the project to date, along with an expected 10,000 ton metric tons of greenhouse gas reduction with the implementation of those lights once they're completely installed, those are directly tied to the reduction of the energy consumption and doesn't include the indirect savings from fewer truck repair roles and more efficient dispatching of those.

0:30:58.710 --> 0:31:0.980
Hermann, Charles
Technologies repairs as well.

0:31:5.30 --> 0:31:8.160
Hermann, Charles
That's uh, that's uh. If we could Jonathan go to the next slide.

0:31:12.620 --> 0:31:16.310
Hermann, Charles
And this slides going to be presented by Bou Reed from Guth Vacanza.

0:31:35.780 --> 0:31:36.610
Bou Reed
Can you all hear me?

0:31:38.510 --> 0:31:39.460
Jonathan Aronoff
Yes, we can hear you bro.

0:31:39.880 --> 0:31:40.190
Bou Reed
Great.

0:31:41.400 --> 0:32:10.790
Bou Reed
So as part of this pilot, we installed three different manufacturers nodes, the NLC nodes that we use utilized were from Phillips or were formally Phillips, which is signify we installed the LLC 7290 note we also installed formally known as SEMCON. The quantela IS LC307 pin note and the ubiquia UB cell. Each of these nodes.

0:32:11.230 --> 0:32:20.340
Bou Reed
Function in a very similar way and provide the customers with a very similar platform to be able to interact with those fixtures.

0:32:21.380 --> 0:32:50.950
Bou Reed
It's gonna set control node. I'll replaces the dust to dawn photocell. The node plugs directly into the Nemo receptacle socket, utilizing the five or seven pins of that socket to provide control and dimming of those fixtures. The nodes that we used for this pilot, we're all cellular based nodes, therefore they come with a SIM con and communicate directly to the Internet and then interact with.

0:32:51.110 --> 0:33:20.710
Bou Reed
These cloud based web interface. Those web interfaces provide GPS location of each of those fixtures and nodes overlaid on a map, which allows for you to find each of the assets on that map in any either interact with them on a singular basis by a group or globally either controlling or dimming all of them. Additionally, though.

0:33:21.120 --> 0:33:52.370
Bou Reed
And the nodes will record the power usage with an accuracy of a .5% per their cut sheets and monitors for faults, and provides real time information back to the interface on what power condition was happening before that fault may have occurred. It does allow for scheduling and programmable dimming, meaning that they can do adaptive dimming or do dimming all the time.

0:33:52.500 --> 0:33:55.410
Bou Reed
Which can extend the life of the fixture.

0:33:56.830 --> 0:33:58.20
Bou Reed
All of the nodes.

0:33:59.970 --> 0:34:2.320
Bou Reed
Are capable of.

0:34:4.400 --> 0:34:21.590
Bou Reed
Real time reporting and be able to provide a detailed reports of the usage as well as be able to monitor whether or not you have had outages throughout in the communicate those outages back to the communities for easier.

0:34:23.130 --> 0:34:28.920
Bou Reed
Maintenance and such. So those are the the three nodes that we we use for the pilot.

0:34:39.90 --> 0:34:39.860
Jonathan Aronoff
Thank you, Boo.

0:34:40.310 --> 0:34:40.570
Bou Reed
Yep.

0:34:40.970 --> 0:34:57.870
Jonathan Aronoff
If you have any questions about NLC nodes, uh, please enter those in the Q&A, we can do our best to answer those at the end of this section, we'll now hand it over to Eric Caban from O&R to talk about the tariff that governs rates and billing for customer owned street light.

0:35:0.280 --> 0:35:9.160
Caban, Eric D
OK, thanks. Good morning, everyone. So under service classification, 6A customer has three options for service depending on their service type.

0:35:9.850 --> 0:35:24.670
Caban, Eric D
So quickly, umm service type A is for overhead service. Service Type B would be for underground service and that's the only thing really differentiating these two service types because charges under both are calculated the same exact way.

0:35:25.380 --> 0:35:29.710
Caban, Eric D
And then there's a third option, which is for metered service under service Type C.

0:35:30.500 --> 0:35:43.130
Caban, Eric D
So under service type A customers are billed for usage based on the monthly burn hours table, which reflects the approximate daunted dust service for photocell controlled illumination on a monthly basis.

0:35:43.980 --> 0:35:50.750
Caban, Eric D
So I'll quickly take you through a delivery charge for a fixture under service type A, which is quite straightforward.

0:35:51.600 --> 0:35:58.960
Caban, Eric D
OK, so the current rate for type A which is shown on the slide is approximately 8.25 cents per kWh.

0:35:59.620 --> 0:36:6.380
Caban, Eric D
So using the month of March is my example. The delivery charge for a 46 Watt LED fixture would be the rate.

0:36:7.200 --> 0:36:18.490
Caban, Eric D
Times a wattage converted to kW times the number of burn hours, which for March is 358, and so the resulting delivery charge would be for the fixture would be $1.36.

0:36:19.240 --> 0:36:32.250
Caban, Eric D
Now obviously immunities are gonna have more than one light, but I just want to highlight that the per bulb delivery charges are not particularly onerous, especially when you consider that the vast majority of new installs will be efficient LEDs with low wattage values.

0:36:33.350 --> 0:36:50.830
Caban, Eric D
OK. So moving to service Type C again, uh customers under service Type C are metered for their actual usage and the rate for this service is about 7.3 cents per kWh. And lastly, customers under this service type would also incur customer charge of $24.00 per month.

0:36:51.910 --> 0:36:56.920
Caban, Eric D
OK, so now I'm going to hand it back to Carly, who's going to talk about standards for revenue grade metering.

0:37:1.900 --> 0:37:24.320
Murphy Rodriguez, Karleigh F
Thanks, Eric. As mentioned before, for O&R's part of the pilot, we gathered usage data by installing meters on the 23 St. lights in Orangetown. We did this so that we could treat our data as a control and comparing it to the NLC node. Data owner follows all of the appropriate procedures and policies put forth by the PSC regarding electric meter approval and maintenance.

0:37:25.400 --> 0:37:57.810
Murphy Rodriguez, Karleigh F
As directed by New York codes rules and regulation #16, part 93 only meters approved by the PSC, can be used for the purposes of customer billing. The process set forth in part 93 requires any new meter to be sponsored by a New York utility with a letter of intent to use, as well as an application for approval from the meter manufacturer. All meters must comply with the requirements specified in acceptable performance of new types of electric meters and instrument Transformers of the latest version of the American National standards codes.

0:37:57.890 --> 0:38:6.130
Murphy Rodriguez, Karleigh F
Of electricity metering and CC-12 once approved, the metering device will appear on the approved meter list published by the PSC.

0:38:7.830 --> 0:38:25.170
Murphy Rodriguez, Karleigh F
All meters utilized by owner for purposes of registering and accumulating usage or consumption for billing, follow the above rigorous application and review process. The process is intentionally detailed and specific because meters are used to calculate utility bills for customers and generate revenue for utilities.

0:38:26.300 --> 0:38:53.660
Murphy Rodriguez, Karleigh F
Oversight by the PSC is mandatory and strictly governs the process in order to ensure legitimacy, accuracy and confidence in metering of energy. Additionally, it is important to note that New York utilities are required once purchased to maintain a custom chain of custody of metering devices. Another important item to mention is that because meters are deployed at customer locations, random yearly testing of meters is also required to ensure accuracy over time.

0:38:54.730 --> 0:38:59.960
Murphy Rodriguez, Karleigh F
Now I'll hand it over to Chris Gonzales to speak to the technical and engineering review of the NLC nodes.

0:39:0.820 --> 0:39:1.170
Murphy Rodriguez, Karleigh F
Chris.

0:39:17.950 --> 0:39:18.760
Gonzales, Chris
Thank you, Carly.

0:39:18.560 --> 0:39:19.490
Jonathan Aronoff
Getting in person.

0:39:24.620 --> 0:39:29.170
Gonzales, Chris
Own our also evaluated the use of NLC nodes from a technical standpoint.

0:39:30.80 --> 0:39:37.260
Gonzales, Chris
The review determined that installation and use of NLC nodes would not be detrimental to operations or safety.

0:39:37.960 --> 0:39:44.960
Gonzales, Chris

Specifically, they do not pose a safety concern or detriment to the operation of the OR electric distribution system.

0:39:45.860 --> 0:39:48.380
Gonzales, Chris
They do not interfere with own our communication equipment.

0:39:49.40 --> 0:39:52.230
Gonzales, Chris
And they pose no adverse implications for the joint use system.

0:39:55.940 --> 0:40:12.10
Gonzales, Chris
However, installation of NLC nodes changes to characteristic of the street light by adding a communications function and thereby void the communication worker safety zone exemption for the street lights. As stated in the National Electric Safety Code.

0:40:13.260 --> 0:40:20.950
Gonzales, Chris
Street lights themselves may be installed within the 40 inch communication worker safety zone between telecom and supply attachments.

0:40:22.30 --> 0:40:26.960
Gonzales, Chris
The following steps would be required for NLC attachment by third party customers.

0:40:27.920 --> 0:40:42.290
Gonzales, Chris
A field survey for all locations included in design to assess compliance and if out of compliance, make ready work to adhere to the company standards and the National Electric Safety Code, allowing for the required clearance.

0:40:43.210 --> 0:40:49.900
Gonzales, Chris
The technical and engineering review did not comprise testing or assessment of the metering accuracy.

0:40:50.870 --> 0:40:51.640
Gonzales, Chris
Back to you, Carley.

0:40:56.650 --> 0:41:2.440
Murphy Rodriguez, Karleigh F
At this point, we're going to pause and we're going to check in and see if we have any questions on the overview so far.

0:41:3.130 --> 0:41:4.250
Jonathan Aronoff
Dylan, can you let us know?

0:41:3.80 --> 0:41:4.300
Murphy Rodriguez, Karleigh F
Jonathan, can you let us know?

0:41:5.760 --> 0:41:7.270
Murphy Rodriguez, Karleigh F
Early curious we had.

0:41:5.520 --> 0:41:8.420
Jonathan Aronoff
My Carley? Sure. So we've had a couple of questions.

0:41:9.640 --> 0:41:11.410
Jonathan Aronoff
Made a question about the.

0:41:12.380 --> 0:41:14.200
Jonathan Aronoff
Are the nodes installed?

0:41:15.40 --> 0:41:41.230
Jonathan Aronoff
On street lights and four individual St. lights and the answer is yes, an NLC node is installed directly to a street light. It sits on top and we've and David, Maya from Nike responded that the cost for each node is 95 to $140 per device.

0:41:42.850 --> 0:41:55.420
Jonathan Aronoff
We also had a question about the meeting materials. Uh, yes, this presentation will be filed along with a recording and transcript and that will be filed with the matter.

0:41:55.900 --> 0:41:58.630
Jonathan Aronoff
Uh, with to the PSC.

0:42:0.160 --> 0:42:0.830
Jonathan Aronoff
Umm.

0:42:2.520 --> 0:42:7.990
Jonathan Aronoff
Another question about monthly communication and hosting cost. Uh, so that is.

0:42:9.980 --> 0:42:13.180
Jonathan Aronoff
So I think the question is asking about if there is a.

0:42:13.980 --> 0:42:26.320
Jonathan Aronoff

Uh service charge from the NLC node manufacturer for the digital platform, and OK, yes per node. So yes, we'll have to.

0:42:28.240 --> 0:42:29.920
Maya, David
The document that Jonathan if you'd like.

0:42:26.860 --> 0:42:32.920
Jonathan Aronoff
Uh, get back to you on that, we'll we will get that information for you.

0:42:38.140 --> 0:42:43.470
Murphy Rodriguez, Karleigh F
OK, so I think now I will hand it off to Rich Sullivan to walk us through the pilot outcomes.

0:42:44.220 --> 0:42:46.190
Murphy Rodriguez, Karleigh F
And over to rich.

0:42:48.430 --> 0:42:49.220
Sullivan, Richard J.
Thank you, Carly.

0:42:51.560 --> 0:42:56.850
Sullivan, Richard J.
First, let's look at how the pilot was set up to collect data over a six month period.

0:42:57.820 --> 0:43:23.290
Sullivan, Richard J.
NYPA installed 23 NLC nodes comprising as described as three models of devices. Quantela signify and ubiquia. The dimming schedules was as follows, 100% for for dust from dust to 11:00 PM and 50% from 11:00 PM to dawn. The nodes captured usage data to platforms using as described previously, asset cellular network capabilities.

0:43:27.160 --> 0:43:40.290
Sullivan, Richard J.
Our own concurrently own are installed meters on the 23 St. lights using our MDMS system. Our a meter data management system to capture usage data at 5 minute intervals.

0:43:42.660 --> 0:43:53.980
Sullivan, Richard J.
All the street lights were LED compatible with NLC nodes. 16 lights used 46 watts and seven lights use 68 Watt bulbs.

0:43:57.440 --> 0:43:58.120
Sullivan, Richard J.
Next slide please.

0:44:4.400 --> 0:44:9.530
Sullivan, Richard J.
For the framework to evaluate our results on our meters were our control group.

0:44:10.520 --> 0:44:32.300
Sullivan, Richard J.
We compare the data gathered by the NLC nodes and the meters looking for three things. Accuracy, consistency and reliability. Furthermore, we examine meter data to gain a better understanding of how the street lights performed compared to expected electric usage and estimated monthly burn outs.

0:44:37.220 --> 0:44:38.40
Sullivan, Richard J.
Next please.

0:44:40.830 --> 0:44:45.820
Sullivan, Richard J.
Here we have a couple of charts that display readings for representative own our meter.

0:44:47.360 --> 0:45:0.550
Sullivan, Richard J.
Over a single day and a full week during summer of 2022, the Blue line represents the meter readings in kilowatt hours at Arrow hourly and daily intervals the green lines.

0:45:1.330 --> 0:45:6.540
Sullivan, Richard J.
Represent the upper and lower bounds for an accuracy standard to .8%.

0:45:7.810 --> 0:45:9.30
Sullivan, Richard J.
This standard is used.

0:45:9.660 --> 0:45:12.510
Sullivan, Richard J.
For the testing and calibration of our own equipment.

0:45:13.840 --> 0:45:20.30
Sullivan, Richard J.
The daily totals do not change much day-to-day, so the green lines are easier to distinguish here.

0:45:20.920 --> 0:45:21.620
Sullivan, Richard J.
However.

0:45:22.300 --> 0:45:26.640
Sullivan, Richard J.
A dimming schedule means that the hourly usage will vary throughout the night.

0:45:27.490 --> 0:45:48.680
Sullivan, Richard J.
So in the top chart is you can see of hourly data. You get a sense of how stringent the accuracy standard

is. You can barely distinguish it from the meter readings themselves. As we look at comparison charts in the next few sides, next few few slides. Keep in mind that we were looking for accuracy or lack of variance that falls within these green lines.

0:45:52.180 --> 0:45:54.270
Sullivan, Richard J.
Similar to the charts on the previous slide.

0:45:55.720 --> 0:46:11.880
Sullivan, Richard J.
Here we have readings for representative own our meter over a single day and a full week during 2022 for an ubiquia, and I'll see node. In this case we've added lines to represent readings from the node attached to the same to the same street light.

0:46:12.800 --> 0:46:29.960
Sullivan, Richard J.
In the top chart, we see somewhat consistent variance on an hourly basis from O&R meter readings outside of the .8% accuracy standard. In the bottom chart, we see a few daily totals that come close to the to the owner meters, but also four days.

0:46:31.380 --> 0:46:33.820
Sullivan, Richard J.
Where the totals diverge significantly.

0:46:34.820 --> 0:46:42.530
Sullivan, Richard J.
These results are representative we of of what we observed across readings for lights with ubicquia NLC nodes attached.

0:46:45.410 --> 0:46:58.720
Sullivan, Richard J.
There were two outliers in the Group, 1 NLC node was consistently 20 to 40% variant from O&R metering and another had a three month gap in its recording. It's in its recorded readings.

0:47:4.960 --> 0:47:8.30
Sullivan, Richard J.
Here we are looking at representative data for a different street light.

0:47:9.140 --> 0:47:11.860
Sullivan, Richard J.
Which had a quantela NLC node attached to it.

0:47:12.780 --> 0:47:20.530
Sullivan, Richard J.
You can see the hourly readings are somewhat steady, but they do fall outside the .8% accuracy range.

0:47:21.430 --> 0:47:30.500
Sullivan, Richard J.

Daily totals measured by the quantela node are again somewhat steady, but still outside the .8 accuracy range compared to OR meter readings.

0:47:31.500 --> 0:47:33.100
Sullivan, Richard J.
We did not observe any outliers.

0:47:33.970 --> 0:47:38.80
Sullivan, Richard J.
In the Quantela node data, but we will discuss some technical challenge.

0:47:38.900 --> 0:47:41.870
Sullivan, Richard J.
Challenges posed by the Quantela digital platform.

0:47:49.70 --> 0:47:50.700
Sullivan, Richard J.
Next slide please. Next slide please.

0:47:52.340 --> 0:47:52.710
Sullivan, Richard J.
We're.

0:47:55.710 --> 0:47:56.410
Sullivan, Richard J.
It's significant.

0:48:1.450 --> 0:48:2.510
Sullivan, Richard J.
Yes, it is something that.

0:48:3.860 --> 0:48:4.380
Sullivan, Richard J.
You know.

0:48:8.50 --> 0:48:8.760
Sullivan, Richard J.
Anything changed?

0:48:16.420 --> 0:48:18.180
Murphy Rodriguez, Karleigh F
Just one moment while we.

0:48:16.470 --> 0:48:18.220
Sullivan, Richard J.
This moment. Moment, Bobby.

0:48:19.30 --> 0:48:20.840
Murphy Rodriguez, Karleigh F
Work through some technical difficulty.

0:48:19.80 --> 0:48:20.870
Sullivan, Richard J.
Whether you some technical difficulty.

0:48:28.610 --> 0:48:29.60
Sullivan, Richard J.
Switched.

0:48:30.460 --> 0:48:35.390
Sullivan, Richard J.
Slide nineteen. There we go. There we go there. But you we're back.

0:48:37.50 --> 0:48:42.630
Sullivan, Richard J.
Here we are looking at representative data for one more street light, which had a signified NLC node attached to it.

0:48:43.390 --> 0:48:47.470
Sullivan, Richard J.
Daily totals from the from the signify and I'll see nodes came the closest.

0:48:48.290 --> 0:48:55.680
Sullivan, Richard J.
To the owner, meter readings occasionally falling within the .8% accuracy standard. However, we do not see spikes of variance here.

0:48:56.440 --> 0:49:7.840
Sullivan, Richard J.
Two to four instance the variance per week were commonly we do see spikes of variance here 2 to 4 instances instances of variance per week were commonly observed across a signified devices.

0:49:9.710 --> 0:49:25.380
Sullivan, Richard J.
We do not presently have access to hourly interval data for the signified devices. We understand from the vendor that it does exist, but is, but it is not accessible via the digital platform and they have so far not been able to provide it for analysis.

0:49:31.520 --> 0:49:43.530
Sullivan, Richard J.
In this slide, we're taking a big picture. The picture view. We looked at monthly usage data from both NLC nodes and there are associated O&R meter for each monthly total.

0:49:44.360 --> 0:49:45.450
Sullivan, Richard J.
What was the variance?

0:49:46.550 --> 0:49:59.870
Sullivan, Richard J.

Was it within the .8% accuracy, accuracy standard or did it come very close shown here within the green lines of ± 1%? Or was it variant by 5% up to 10% or more?

0:50:1.610 --> 0:50:11.450
Sullivan, Richard J.
Then we group these variances by device model. Here we are showing the proportion of monthly totals for each device model at the intensity of variance.

0:50:13.800 --> 0:50:20.820
Sullivan, Richard J.
We observed that the majority of monthly usage totals for ubicquia devices exhibited variant below the accuracy accuracy standard.

0:50:22.10 --> 0:50:30.210
Sullivan, Richard J.
Monthly usage totals for quantela devices exhibited variants from a from both above and below the accuracy standard.

0:50:31.340 --> 0:50:37.480
Sullivan, Richard J.
Signify devices demonstrated lower but frequent variants in its monthly usage totals.

0:50:43.420 --> 0:50:45.970
Sullivan, Richard J.
This next slide provides.

0:50:47.70 --> 0:50:55.200
Sullivan, Richard J.
More in usage insights, we also looked at the impact of dimming on electric usage in addition to the pilot.

0:50:56.860 --> 0:51:0.820
Sullivan, Richard J.
We performed a control study so we could analyze how usage was reduced.

0:51:1.840 --> 0:51:7.70
Sullivan, Richard J.
At 100 percent, 70% and 5050% illumination.

0:51:7.730 --> 0:51:8.910
Sullivan, Richard J.
Shown in the chart here.

0:51:10.600 --> 0:51:20.230
Sullivan, Richard J.
As you if you recall the NLC nodes were attached to both 68 Watt and 46 Watt LED, so there was a difference in baseline electric usage.

0:51:21.20 --> 0:51:27.630
Sullivan, Richard J.
And observed reduction at dimming levels. This also helps for observing differences in performance.

0:51:28.460 --> 0:51:30.930
Sullivan, Richard J.
Between the device models.

0:51:32.180 --> 0:51:40.670
Sullivan, Richard J.
Generally, in in general 30% dimming reduced usage by 10% by 16 percentage you can see.

0:51:41.440 --> 0:51:43.430
Sullivan, Richard J.
And 50% dimming.

0:51:44.340 --> 0:51:45.990
Sullivan, Richard J.
Generally reduced usage.

0:51:46.830 --> 0:51:48.960
Sullivan, Richard J.
By 35 to 36%.

0:51:50.0 --> 0:51:52.990
Sullivan, Richard J.
For the entire pilot Ubiquiti devices.

0:51:55.910 --> 0:51:58.330
Sullivan, Richard J.
Resulted in 14.2%.

0:51:59.760 --> 0:52:3.830
Sullivan, Richard J.
Usage reduction compared to expected values for the street lights.

0:52:4.630 --> 0:52:9.490
Sullivan, Richard J.
17.6% electric usage increase.

0:52:10.300 --> 0:52:10.660
Sullivan, Richard J.
Was.

0:52:11.640 --> 0:52:12.410
Sullivan, Richard J.
Observed.

0:52:13.50 --> 0:52:16.620
Sullivan, Richard J.
For signified devices, this result was unexpected.

0:52:17.420 --> 0:52:21.70
Sullivan, Richard J.
And did not appear to be due to the NLC nodes themselves.

0:52:22.510 --> 0:52:30.240
Sullivan, Richard J.
6.1% but 6.1% electric usage increase existed compared to expected values for the street lights.

0:52:31.810 --> 0:52:52.30
Sullivan, Richard J.
With Quantela devices attached, as we mentioned earlier, the digital platform for controlling the Quantela devices pose significant technical challenges due to programming oversight. They did not dim his intended for the duration of the pilot period. However, it is notable that there was an increase in usage instead of equivalents.

0:52:52.960 --> 0:52:54.230
Sullivan, Richard J.
To expected values.

0:52:56.560 --> 0:52:59.130
Sullivan, Richard J.
Here will we will pause for for questions.

0:53:10.850 --> 0:53:12.990
Frosco, Jacqueline
OK, Jonathan, many questions.

0:53:14.210 --> 0:53:14.490
Sullivan, Richard J.
Uh.

0:53:14.350 --> 0:53:46.860
Frosco, Jacqueline
No questions, no. OK, so I think we're at the point where we really wanna get into the collaborative and begin to facilitate the discussions. So they go to next slide, please. OK, so I thought we would do first is let's take a recap of the pilot objectives. It was one to determine if the NLC nodes can be utilized in place of revenue grade meters for accurate metering of customer owned St. lights and then two develop and assess the potential methodologies to account for reduced electric usage.

0:53:47.30 --> 0:53:48.790
Frosco, Jacqueline
And the impacts on customer bills?

0:53:49.460 --> 0:53:52.840
Frosco, Jacqueline
OK, so here's where we author topics for discussion.

0:53:54.410 --> 0:53:57.630
Frosco, Jacqueline
And you can see them there on this slide. So given that.

0:53:58.960 --> 0:54:15.470
Frosco, Jacqueline
Given that, here's what we can assess about the variance between O&R meters and the NLC nodes. O&R's interpretation is the data did not distract demonstrate NLC node meter readings within accuracy standards to substitute for revenue grade meters.

0:54:16.600 --> 0:54:25.40
Frosco, Jacqueline
Variants and device reliability we observe was also not enabled, did not also enable the use of the NLC. No readings for auditing purposes.

0:54:26.440 --> 0:54:39.500
Frosco, Jacqueline
So those are the two main observations that we saw from what Rich provided as the results at this point, I'll pause and see if Chuck or David from NYPA would also like to give comment on the observations.

0:54:43.850 --> 0:54:45.610
Maya, David
Bio. Yes. Uh, can you hear me?

0:54:48.450 --> 0:54:49.560
Jonathan Aronoff
Yes, we can hear you, David.

0:54:48.470 --> 0:54:49.720
Frosco, Jacqueline
Yes, we can hear you, David.

0:54:50.280 --> 0:55:20.370
Maya, David
Yes, I the world coming up in the morning. Even my hair from New York. Power 30. Happy to be here as well. Ohh yeah. So I just wanna you know the the Becker when they'll confirm with Jackie had that you know during our analysis and we're doing our collaboration with we did find so that the data sets were quite erratic. You know there wasn't anything that we found conclusive. So overall we have been the you know the the results inconclusive in the terms of that.

0:55:20.490 --> 0:55:28.700
Maya, David
Data points that will be do agree with the OCR's that finding that at this time you know the the nodes cannot be used.

0:55:29.0 --> 0:55:58.230
Maya, David
Uh, as a as a if ever new grade that neither the without the further analysis and you know what that thing, you know, the people, the right to there are other variables that make here as well. You know we did

install windows on any of the pictures so that were never intended to demo or design as the demo so maybe that had played a role as well nonetheless you know at this point so that we do support or not to do.

0:55:58.800 --> 0:55:59.180
Maya, David
Condition.

0:56:0.930 --> 0:56:1.270
Maya, David
Thank you.

0:56:10.980 --> 0:56:11.390
Frosco, Jacqueline
OK.

0:56:12.100 --> 0:56:13.910
Frosco, Jacqueline
Thank you. Appreciate that, David.

0:56:17.110 --> 0:56:28.510
Frosco, Jacqueline
So as a result of the data presented, I'm just going to be stated oh and and I believe collectively and mutually we agree modifications to the current tariff under SC Six would remain the same at this point.

0:56:30.240 --> 0:56:36.450
Frosco, Jacqueline
So within our agenda, I think now we have slotted to take a break to.

0:56:37.160 --> 0:56:39.460
Frosco, Jacqueline
OK. I'm sorry. Go ahead. Please. We have the question.

0:56:39.60 --> 0:56:39.480
Jonathan Aronoff
Question.

0:56:43.250 --> 0:56:46.40
Frosco, Jacqueline
We had a question from Mike, Sweden.

0:56:43.270 --> 0:56:46.120
Jonathan Aronoff
We have a question from Mike Sweeten.

0:56:46.900 --> 0:56:52.730
Frosco, Jacqueline
Uh, from the town of Warwick. Mm-hmm. They have you ubiquia nodes. OK, so based on this study.

0:56:47.60 --> 0:56:52.750
Jonathan Aronoff
From the town of Warwick, they have ubiquitin nodes, so based on this study.

0:56:53.460 --> 0:56:55.210
Frosco, Jacqueline
Would own our and.

0:56:53.480 --> 0:56:55.410
Jonathan Aronoff
Would own our and.

0:56:57.570 --> 0:56:58.50
Jonathan Aronoff
Asking.

0:56:57.540 --> 0:56:58.160
Frosco, Jacqueline
Asking for.

0:56:59.280 --> 0:57:3.20
Frosco, Jacqueline
Yes. So we not agree that this could be used to dim their lights.

0:57:3.660 --> 0:57:5.550
Frosco, Jacqueline
And to reduce the cost to the town.

0:56:59.240 --> 0:57:5.560
Jonathan Aronoff
PSC not agree that this could be used to dim their lights and to reduce the cost to the town.

0:57:7.690 --> 0:57:13.630
Frosco, Jacqueline
OK. Hi, Mike. First of all, Jonathan, I think I may need you to repeat that cause I'm not quite sure I understand.

0:57:18.630 --> 0:57:18.960
Dugal, Tanya (DPS)
Ticket.

0:57:14.890 --> 0:57:33.270
Frosco, Jacqueline
And I'm not sure it's supposed to O&R or to to DPS staff. Could you just repeat the question for us? Sure. OK. So you asked if own our in the PSC would agree umm, that the NLC nodes could be used to dim their lights one and to reduce the cost to the town.

0:57:33.990 --> 0:57:37.630
Frosco, Jacqueline
And Tanya, thank you and has said she would.

0:57:38.340 --> 0:57:39.210
Frosco, Jacqueline
Like to.

0:57:42.80 --> 0:57:42.910
Dugal, Tanya (DPS)
And yeah.

0:57:40.20 --> 0:57:43.870
Frosco, Jacqueline
Sure. Let me we're gonna unmute you, Tanya. One moment.

0:57:14.970 --> 0:57:43.880
Jonathan Aronoff
And the measure, as opposed to O&R or to to DPS staff. Could you just repeat the question for us? Sure. OK. So yeah, asked if Ohtar and the PSC would agree that the NLC nodes could be used to dim their lights one and to reduce the cost to the town. And Tanya Dugal has said she would like to respond. Let me. We're gonna unmute you. Tanya. Hold on it.

0:57:45.700 --> 0:57:45.960
Frosco, Jacqueline
OK.

0:57:47.450 --> 0:57:54.570
Dugal, Tanya (DPS)
Hi, this is Tony Dugal from staff. I'm joined in the race from the rates section. I'm in the office of Innovation and Markets.

0:57:56.410 --> 0:58:11.910
Dugal, Tanya (DPS)
I don't work directly on Terrace, but Sandra Sweet does in Brian Fisher does. So as far as owners comment that they don't believe there's a change needed to the tariff. I think it depends on what the tariff is changing. But putting that aside for a moment.

0:58:12.670 --> 0:58:19.950
Dugal, Tanya (DPS)
The idea that adaptive lighting schedules can be implemented without a metering node is possible as other utilities are doing that.

0:58:21.960 --> 0:58:32.830
Dugal, Tanya (DPS)
Whether or not the nodes are functioning properly, I'm not sure specifically how other utilities are testing that and managing that for their adaptive lighting tariffs.

0:58:33.870 --> 0:58:52.240
Dugal, Tanya (DPS)
National Grid is also on the call, I believe, and perhaps can talk to that a little bit more. But as far as implementing adaptive tariffs, we don't necessarily need to have nodes with meter accuracy in order to Prev. Adaptive lighting tariffs. Does that answer the question?

0:58:57.620 --> 0:59:9.920
Jonathan Aronoff
Thank you, Tanya. To clarify uh, National Grid, uh did submit information which we will be including in the filing. They were not able to attend today.

0:59:11.220 --> 0:59:19.810
Jonathan Aronoff
They have a Rev demo project ongoing and they will. They informed us they will be filing their report toward the end of the year.

0:59:24.200 --> 0:59:34.550
Dugal, Tanya (DPS)
OK um, but I know as far as they do have active tariff leaves that support adaptive light on tariffs as this nice egg at the moment.

0:59:35.340 --> 0:59:42.930
Dugal, Tanya (DPS)
That do not require the node to be providing the meter, they just kind of take a proration of the monthly bill.

0:59:43.940 --> 0:59:55.250
Dugal, Tanya (DPS)
And use the specs from the node to facilitate what the tariff charges would be and and Sandra can talk more. That's more specifically if she's available to respond, but.

0:59:56.170 --> 1:0:0.800
Dugal, Tanya (DPS)
As far as the question goes, I want to make sure that answers the question appropriately.

1:0:1.970 --> 1:0:3.180
Dugal, Tanya (DPS)
From staff view anyway.

1:0:9.180 --> 1:0:23.110
Sweet, Sandra (DPS)
Yeah, this is Sandra sweet. From staff. I work in the office of Rates and Tariffs and you know any rates are that are allowed to be charged are essentially in the tariffs so.

1:0:23.830 --> 1:0:27.160
Sweet, Sandra (DPS)
At at this point in time, because it's a pilot project.

1:0:28.730 --> 1:0:33.200
Sweet, Sandra (DPS)
You know, depending on which utilities actually have that pilot project.

1:0:34.440 --> 1:0:47.700
Sweet, Sandra (DPS)

The pilot project rates are not necessarily always in the tariffs. However, there's a process in place that can be charged to customers.

1:0:58.960 --> 1:1:0.450
Sweet, Sandra (DPS)
Does that answer the question?

1:1:2.380 --> 1:1:5.30
Dugal, Tanya (DPS)
I think the commenters, Mike said yes.

1:1:5.580 --> 1:1:6.330
Sweet, Sandra (DPS)
OK. Thank you.

1:1:7.20 --> 1:1:12.770
Dugal, Tanya (DPS)
I'm sorry he has a follow up. If I understand it or reduction could be provided if it dimming regimen is implemented.

1:1:13.460 --> 1:1:15.140
Dugal, Tanya (DPS)
Is that accurate? Yes.

1:1:15.390 --> 1:1:15.800
Sweet, Sandra (DPS)
Yes.

1:1:28.320 --> 1:1:29.750
Frosco, Jacqueline
OK. Thank you for that.

1:1:30.60 --> 1:1:30.730
Frosco, Jacqueline
Thank you. Bye.

1:1:32.750 --> 1:1:40.790
Frosco, Jacqueline
OK, so at this point in our agenda, I believe is where we're going to take the break. We have scheduled a 30 minute break and this gives us.

1:1:41.370 --> 1:1:53.970
Frosco, Jacqueline
Umm I a chance to recap, we'll collect all of the data as per comeback and put into what's discussion. Specifically, some of the inputs we just heard.

1:1:55.190 --> 1:2:6.990
Frosco, Jacqueline
And we'll be able to give our comment well and do our follow up from Orange and Rockland perspective if everybody is good with that, then we'll reconvene. Let's just say 11:10 I think would be enough time.

1:2:9.20 --> 1:2:15.290
Frosco, Jacqueline
Right. Appreciate everybody's inputs. I'm gonna participation to this point and we'll be back. Thank you.

1:27:20.940 --> 1:27:22.310
Jonathan Aronoff
So my mic is going on now.

1:27:26.490 --> 1:27:33.160
Frosco, Jacqueline
OK, welcome back, everyone. Jonathan, I'm just gonna do a quick check. Do we have everybody?

1:27:34.490 --> 1:27:46.40
Frosco, Jacqueline
Everybody ready? Everyone's still in the meeting. We we may give them a minute. Just mind. We just give a minute. We'll do a quick check just to make sure everybody's back and ready.

1:29:19.650 --> 1:29:36.420
Frosco, Jacqueline
OK. OK. Thank you, everybody. I think we're gonna begin our next session. So welcome back. I'm not a good information. I think that was shared today and appreciate everybody's comments as we come back from the break and and listening to all the comments that were provided.

1:29:38.120 --> 1:29:53.890
Frosco, Jacqueline
Ohh in our we like to just kind of reiterate what we're seeing in our considerations from the results. So I think what we've proven out in the data shows is that there is wide variations in the nodes.

1:29:54.980 --> 1:30:10.440
Frosco, Jacqueline
Capturing of the energy usage the data as we see it is in audible at the moment. It would really be a challenge to understand if not impossible. Right now the burn hours with any level of accuracy that we have right now.

1:30:11.920 --> 1:30:29.840
Frosco, Jacqueline
And this schedules will be challenging to verify as submitted. So I think that was the basis in our interpretation of the results. And if I don't know if anybody wants to give other comment at that point or anybody on the O&R team as well would want to lend comment, we can offer that too.

1:30:34.200 --> 1:30:34.460
Frosco, Jacqueline
OK.

1:30:35.250 --> 1:30:36.950
Frosco, Jacqueline
I'm. I'm yeah.

1:30:37.930 --> 1:30:38.530
Frosco, Jacqueline
So do we have?

1:30:39.270 --> 1:31:10.240
Frosco, Jacqueline
No, OK, working through this technology. So again, I'll just reiterate consensus some of the pilot participants, uh, orange and Rockland and NYPA the nodes do not meet the current standard to substitute for utility grade metering. I I think it's important to say though that the company is open to engaging in further discussions as this technology matures and develop. We do have our standard that we could offer Mr. Polities that do either have nodes or in considerations of nodes and that would be metering.

1:31:10.310 --> 1:31:27.480
Frosco, Jacqueline
Each night, understanding that there might be challenges with that from a business perspective, but it's what we have right now and can offer. So with that, I'll pause. Is there any other information that we want to speak about than anybody would want recorded as part of this collaboration today?

1:31:35.430 --> 1:31:40.480
Frosco, Jacqueline
Jonathan, I'm looking over, by the way, looking over Jonathan. Go ahead, Jonathan, you speak.

1:31:43.110 --> 1:31:52.120
Frosco, Jacqueline
OK, bear with us here. I was just looking at Jonathan to give me a nod if there is any questions or inputs at this point, no. OK. So with that, then let's just move.

1:31:52.230 --> 1:31:53.460
Frosco, Jacqueline
Do.

1:31:54.630 --> 1:31:59.160
Frosco, Jacqueline
Next steps I think Mike might have said something. Jonathan, do we have to applause, you just need to say.

1:32:0.240 --> 1:32:4.950
Frosco, Jacqueline
Perfect. Thank you, Mike. OK. So our next steps.

1:32:7.590 --> 1:32:38.580
Frosco, Jacqueline
OK, so as we read reiterated, right, we'll be recording and we'll have this transcript and we will file with staff. We will look at and compile and synthesize the findings of the collaborative and recommendations. Pilot participants were review and comment on the recommendations. These are just our steps forward outlining them and then we're aware of and we'll complete the technical conference as ordered and we have slated that for July 31st to come into compliance with the water.

1:32:42.120 --> 1:33:6.630
Frosco, Jacqueline
At this point, I would just like to offer a very much appreciation and thank you. There was a lot of work by many people on this call that went into getting us to this point with the collaboration. I think it's important everybody did their due diligence in understanding this new technology and options for energy savings. And I'd like to just say thank you at this point and looking forward to our next steps.

1:33:9.840 --> 1:33:14.540
Frosco, Jacqueline
Anything I'm gonna confer with Jonathan again? Here. Thank you, Mike, appreciate that comment.

1:33:12.910 --> 1:33:14.600
Jonathan Aronoff
Thank you, Mike. Appreciate that comment.

1:33:16.140 --> 1:33:16.600
Frosco, Jacqueline
They were just.

1:33:16.80 --> 1:33:20.360
Jonathan Aronoff
So we're just going to one more time to play the.

1:33:21.20 --> 1:33:27.310
Jonathan Aronoff
Contact information if anyone has any comments or follow up questions, please submit them here.

1:33:33.740 --> 1:33:37.880
Jonathan Aronoff
Uh, yes, we have a we have a question from Tanya.

1:33:42.100 --> 1:33:42.330
Jonathan Aronoff
You.

1:33:38.570 --> 1:33:50.980
Dugal, Tanya (DPS)
Yeah, sorry. I'm not sure if I'm still unmuted, so I just wanna make sure I understand. Sorry, I'm having headset issues, so I apologize if you can't hear me very well. I'm just want to make sure I understand.

1:33:50.720 --> 1:33:51.820
Jonathan Aronoff
We we can hear you OK.

1:33:52.70 --> 1:33:56.680
Dugal, Tanya (DPS)
OK, great. So in looking at the presentation, um.

1:33:58.740 --> 1:33:59.280
Dugal, Tanya (DPS)
We.

1:34:0.320 --> 1:34:8.320
Dugal, Tanya (DPS)
This is more to the people on the call. Uh, from external parties. We really would like to hear from you guys as far as.

1:34:9.30 --> 1:34:27.580
Dugal, Tanya (DPS)
What you're hoping what you're wanting from these nodes, what you're experience if you have them, has been what type of analysis you might have staff doing if you are a A community that has looked to install these on your own or and just a general sense of.

1:34:29.130 --> 1:34:32.180
Dugal, Tanya (DPS)
What you're hoping to achieve, I don't recall.

1:34:32.950 --> 1:34:42.310
Dugal, Tanya (DPS)
Whether or not you guys spoke to the evaluation of cost savings from dimming, did you guys, I don't think I missed that but.

1:34:44.110 --> 1:34:53.880
Dugal, Tanya (DPS)
Did you guys speak to the findings related to potential energy savings, financial savings correlation with the nodes regardless of the failure rates?

1:34:54.700 --> 1:34:56.350
Dugal, Tanya (DPS)
At the dimming aspect of things.

1:35:0.220 --> 1:35:1.370
Jonathan Aronoff
Hi Tonya's uh.

1:35:2.40 --> 1:35:5.810
Jonathan Aronoff
No, that was not part of the pilot scope.

1:35:6.540 --> 1:35:6.930
Dugal, Tanya (DPS)
OK.

1:35:11.320 --> 1:35:13.350
Dugal, Tanya (DPS)
So if if customers have.

1:35:14.840 --> 1:35:35.660
Dugal, Tanya (DPS)
An understanding of potential you know, anything like that, where the staff team can really learn from real world experiences of these things, any of your own testing that might have been done to talk about failure rates. I understand one customer had responded about them using one of the brands that did experience more failure rates compared to some others.

1:35:36.360 --> 1:35:36.970
Dugal, Tanya (DPS)
Umm.

1:35:38.130 --> 1:35:54.480
Dugal, Tanya (DPS)
So any other additional testing that may have been done outside of this would be useful for us to learn about and really get a sense of what you're all hoping to achieve from these should you implement them and and ultimately calls to them too. Energy savings and cost savings, but.

1:35:54.990 --> 1:36:4.410
Dugal, Tanya (DPS)
A really just want to make sure that we take the opportunity while we have your attention to get that input from you guys and the comment process when that happens.

1:36:9.850 --> 1:36:10.360
Jonathan Aronoff
Thank you.

1:36:8.960 --> 1:36:13.930
Dugal, Tanya (DPS)
Also, did you uh separately for the testers for NYPA and no and our?

1:36:14.720 --> 1:36:22.760
Dugal, Tanya (DPS)
I had there been conversations with the manufacturers to understand their experiences with such similar testing and other jurisdictions.

1:36:28.100 --> 1:36:41.380
Maya, David
Yeah, I got I can answer that. So overall, we've had general conversations on the accuracy of their diameters, but for this particular pilot not yet. So we haven't shared the polling that this time.

1:36:42.420 --> 1:36:56.140
Dugal, Tanya (DPS)
Do you know or the customers that have them potentially? Are there any guarantees related to any of the aspects that this pilot undertook that would protect the company and or the ratepayer from failures and whatnot?

1:36:57.640 --> 1:37:0.480
Maya, David
Uh talking for guaranteed in what sense?

1:37:0.960 --> 1:37:1.730
Dugal, Tanya (DPS)
Like a well.

1:37:2.390 --> 1:37:6.990
Dugal, Tanya (DPS)
Get cost guarantee of being like what is their do they?

1:37:19.260 --> 1:37:19.580
Maya, David
Umm.

1:37:7.700 --> 1:37:37.250
Dugal, Tanya (DPS)
Indicate that they are X percent within the utility grade metering. Do they like as far as like the customer? I'm really more concerned about the customer to may have already purchased these with the patient of being able to use them. Finding out that they are not as accurate as they may have been sold to be. So I'm not sure almost like you know 6-7 years ago some of the manufacturers are dropping 10 year warranties. I know that there's a an ongoing issue with some of the at least one install of lights as far as.

1:37:37.620 --> 1:38:0.660
Dugal, Tanya (DPS)
Manufacturer specs relating to actual usage, so I'm just curious what the manufacturers of these nodes have promised their customers as far as accuracy, reliability, and whether or not there's ways to be compensated if that's the case or replaced, or if there's additional models that might be able to be replaced at no cost, like what type of guarantee and warranty may have been provided to the customers, or will be provided should.

1:38:1.370 --> 1:38:4.490
Dugal, Tanya (DPS)
In you know should this move forward to a next step and?

1:38:5.90 --> 1:38:5.520
Dugal, Tanya (DPS)
Uh.

1:38:7.30 --> 1:38:26.560
Dugal, Tanya (DPS)
You know, version 3.0 might be better than version 1.0 like I don't want this to become ohh we never look at it again. It's more like what is being done to protect customers that have invested in these technologies so far and how we might they continue to evolve and progress into a more accurate format that could be potentially beneficial later.

1:38:28.540 --> 1:38:31.720
Maya, David
Yeah. So that can have a guard, you know, that will turn over.

1:38:31.790 --> 1:38:37.730
Maya, David
I will be in a minute, but overall on the neighbor program so that we don't know the guarantee any.

1:38:37.870 --> 1:38:38.110
Maya, David
With the.

1:38:38.170 --> 1:38:48.80
Maya, David
It's it's, it's it's, it's savings from the dimming aspect. Our goal on on the on the node aspect is more of a.

1:38:48.940 --> 1:39:0.120
Maya, David
Uh, for maintenance purposes, you know it, it gives be customer living because visibility into their system. Yeah. Yeah, yeah, yeah. Helping them meals manage with their asset. But you know better. And we've always been.

1:39:0.200 --> 1:39:9.360
Maya, David
Uh, with the they'll be adding 10 to, you know, the guarantee any, you know, you know the dimming, you know.

1:39:9.440 --> 1:39:11.830
Maya, David
Since the same day because it's.

1:39:12.150 --> 1:39:28.920
Maya, David
Go available currently you're not in the available and I believe you know we wanted to do this. You know this pilot as well to also to confirm this this survival option at this time or not you know and you know the boat was doing anything else so that you wanted to add to that.

1:39:30.630 --> 1:39:45.50
Bou Reed
Yeah. So I I did a lot of the customer facing interactions and at all times we we always properly characterize the difference between a.

1:39:45.720 --> 1:39:46.870
Bou Reed
Approved.

1:39:48.70 --> 1:40:17.520
Bou Reed
Revenue grade meter that is utilized by a utility and the fact that utilities by nature of how they they bill only accept data from really meters that they own. So we we've always qualified that as being as such and and this was more like David alluded to provided to the customers as a as an asset management system.

1:40:17.590 --> 1:40:31.250
Bou Reed
That had the ability to look at usage, but it was never guaranteed to be anymore accurate in in, nor were these like characterized as being approved utility meters.

1:40:32.30 --> 1:40:40.20
Dugal, Tanya (DPS)
So just one just to to restate and and for the people on the call. So the benefactors of these nodes never.

1:40:41.360 --> 1:40:49.480
Dugal, Tanya (DPS)
Advertised it, I mean this will be ultimately up to the customers who decide to buy them. I don't know if you guys know more than I do about which customers are on the call and who installed their lights.

1:40:50.190 --> 1:41:2.680
Dugal, Tanya (DPS)
And what contractors were used and what conversations went into those? So I'm not quite sure if everyone on this call is a NYPA contractor or not and there might be people listening in to the repeat that could attend today and providing comment, but in general.

1:41:3.690 --> 1:41:17.320
Dugal, Tanya (DPS)
What expectations and were assumed or provided as far as the you know, deciding to purchase the nodes and install them at the time of install or after install the LED lights and also?

1:41:18.730 --> 1:41:34.80
Dugal, Tanya (DPS)
And that's mostly a conversation, I guess, between we don't know what I don't, we don't have the a poll of like of the people on this call or of the people and the and the O and our territory. How many customers have chosen each of the brands I studied right now.

1:41:35.670 --> 1:41:51.540
Dugal, Tanya (DPS)
Or maybe even across the state. So at some point the staff concerned kind of shifts from this one pilot to potentially how other ratepayers are affected across the state at the same time, who may be using these brands. So I wasn't sure if the brands themselves have.

1:41:52.620 --> 1:41:58.750
Dugal, Tanya (DPS)
Then discuss with what you said no, but they will be and all the you know just what type of.

1:41:59.420 --> 1:42:8.530
Dugal, Tanya (DPS)
Movement can be made from this as far as protecting customers who decide to invest in them and and making sure that any qualified.

1:42:8.730 --> 1:42:24.160
Dugal, Tanya (DPS)
Uh promises were are backed by some type of warranty or guarantee, so I guess that's more of that. But if

most of the customers who have purchased them have been on the expectation of it's just for internal management, even for company owned lighting assets.

1:42:26.830 --> 1:42:45.140
Dugal, Tanya (DPS)
OK, fair enough. But given the conversations the last several years, as Charles and David, you are aware the push for some of these things, I wasn't sure what type of engagement there's been with the manufacturers themselves for future uses and refinements to do use those for those purposes.

1:42:46.10 --> 1:42:46.470
Dugal, Tanya (DPS)
That's all.

1:43:1.380 --> 1:43:1.670
Dugal, Tanya (DPS)
Right.

1:42:46.120 --> 1:43:4.320
Hermann, Charles
So Tony, this is this is Chuck. And just to reiterate what what David and and Bou have said to date, the primary benefits that we've expressed to customers have been the energy savings and the maintenance savings associated with these.

1:43:5.400 --> 1:43:36.350
Hermann, Charles
As part of our program, NYPA is offering a maintenance service as well and typically about 1/3 of the savings comes from reduced energy cost in about 2/3 of the savings have come from associated maintenance costs. When we eliminate the street light maintenance from a customer's bill. So the projects in and of themselves have always been presented as paying for themselves out of the energy and maintenance savings, just from converting to LED.

1:43:36.910 --> 1:44:8.160
Hermann, Charles
The dimming would just provide, you know if and when tariffs become available, would just provide additional savings for those customers and and another benefit that the customers receive, which a lot of the smaller and more rural towns and villages enjoy is they they do want to be able to just dim the lights at night regardless of whether they're receiving savings or not just because it's a small, quiet town and they want to maintain that rural characteristic.

1:44:8.380 --> 1:44:14.350
Hermann, Charles
And being able to dim those lights, especially in the more residential neighborhoods, is just a benefit to the residents.

1:44:15.120 --> 1:44:45.10
Dugal, Tanya (DPS)
Right. So that's kind of where I do understand NYPA's position. I'm hoping my the leading of the question was hoping to get the commenters on this call to participate in responding to their experiences

with the nodes potentially even the company owned options for using similar nodes and offering services to customers. I understand it was a type of pilot. I understand it was a customer owned asset pilot and I understand we're waiting for national grids pilot to come in as you're all well aware that I'm aware. But the I'm really hoping to.

1:44:45.80 --> 1:44:49.470
Dugal, Tanya (DPS)
Engage the the participants and their experiences with using these nodes.

1:44:51.150 --> 1:44:56.170
Dugal, Tanya (DPS)
Especially identifying the brands of which they use, at identifying their own experiences with them.

1:44:57.570 --> 1:45:2.240
Dugal, Tanya (DPS)
And and really hoping to share that knowledge across the staff team who?

1:45:3.0 --> 1:45:7.310
Dugal, Tanya (DPS)
Are helping to aggregate these things across the state and understand how it's working.

1:45:9.940 --> 1:45:19.810
Dugal, Tanya (DPS)
Given the the ratepayer dollars that went into the pilot and all of that, so mostly, hopefully that helps to the commenters and and I appreciate the the clarifications by the night of staff.

1:45:28.350 --> 1:45:33.210
Hermann, Charles
Tanya, I will elaborate. One other one other thing as well, it's it's been.

1:45:33.900 --> 1:46:5.870
Hermann, Charles
Kind of discussed in the chat and some of the other previous questions as well. But when when David mentioned the cost of those units at 95 to $140 to again to make it easy for our customers, we included with that 10 years worth of data and and portal access and also a 10 year warranty. I think it's a 10 year warranty. Bou correct me if I'm wrong, but that way the customers again don't have that concern with the newer technologies as far as just usefulness.

1:46:9.380 --> 1:46:9.790
Jonathan Aronoff
If any.

1:46:9.440 --> 1:46:17.210
Murphy Rodriguez, Karleigh F
If any of the municipalities want to respond to Tanya's question, Jonathan will raise your hand and he'll enable your microphone.

1:46:19.240 --> 1:46:27.280
Dugal, Tanya (DPS)

And happy to receive those comments in written form if that's easier for participants to elaborate on, but definitely would like to hear from anybody willing to share.

1:46:31.350 --> 1:46:35.960
Jonathan Aronoff
Tanya, do you wanna put your contact information in the chat so folks can have that?

1:46:36.800 --> 1:46:40.30
Dugal, Tanya (DPS)
Sure, when this gets filed to the matter number.

1:46:41.610 --> 1:46:46.860
Dugal, Tanya (DPS)
Are you guys able to reply to the folks who registered for this and shared that information with them?

1:46:48.710 --> 1:46:49.650
Jonathan Aronoff
Yes, that's correct.

1:46:50.610 --> 1:46:50.950
Dugal, Tanya (DPS)
Great.

1:46:56.170 --> 1:47:2.840
Dugal, Tanya (DPS)
Here's my e-mail address, um and any questions that I can't answer. I could definitely facilitate with the staff team.

1:47:3.620 --> 1:47:5.110
Dugal, Tanya (DPS)
And UM.

1:47:6.430 --> 1:47:15.160
Dugal, Tanya (DPS)
E-mail is definitely the most easy way to get a hold of me as I'm not in the office everyday, but we can certainly set up phone calls if if you all want other information or to have the conversation.

1:47:23.850 --> 1:47:24.590
Jonathan Aronoff
I think we're there.

1:47:25.50 --> 1:47:25.210
Dugal, Tanya (DPS)
OK.

1:47:25.280 --> 1:47:25.480
Dugal, Tanya (DPS)
OK.

1:47:25.580 --> 1:47:27.700
Jonathan Aronoff
OK if there.

1:47:26.840 --> 1:47:34.810
Dugal, Tanya (DPS)
Owner question or maybe night, but do you have a sense of how many customers within the O&R territory have nodes in place right now?

1:47:49.210 --> 1:47:49.520
Dugal, Tanya (DPS)
Or.

1:47:37.780 --> 1:48:7.310
Maya, David
Yeah. So as of now, there aren't. I don't believe that the there are any under the type of program that currently have nodes. We are the moving forward on a few other projects within the welcome with this screen. So that's gonna be going towards implementing annotation. But what we're currently does not have any it's folio then he the customer would nodes and O&R actually what there may be some in rock.

1:48:8.10 --> 1:48:8.800
Maya, David
Orange.

1:48:10.280 --> 1:48:13.730
Maya, David
When? Uh, but nothing but the camel. Well, where?

1:48:15.30 --> 1:48:23.210
Dugal, Tanya (DPS)
OK. And own our do you have any other municipalities who didn't use Nico who might have a billable terror or the notes?

1:48:25.280 --> 1:48:27.730
Frosco, Jacqueline
So, so Tanya and so Tanya.

1:48:28.680 --> 1:48:43.120
Frosco, Jacqueline
And all one second technical. OK, good. Tanya. No, I'm gonna say we're fully aware of who's purchased there lights, but if they don't disclose to us or share with that, that's nothing that we would know. I didn't know that Warwick had installed the nodes.

1:48:43.530 --> 1:48:53.980
Dugal, Tanya (DPS)
So just so that this group is aware and and that this has been documented in other tariffs and Sandra Suite had a drop for something else, but I certainly can.

1:48:55.880 --> 1:49:3.290
Dugal, Tanya (DPS)
Provide other information or back that up in other jurisdictions and NYPA can attest to this. The nodes are a separate.

1:49:4.200 --> 1:49:8.750
Dugal, Tanya (DPS)
Wattage that's calculated into the usage for the bills for customer owned assets, so.

1:49:9.600 --> 1:49:16.330
Dugal, Tanya (DPS)
As far as tariffs go, that might be something to our customer company has to implement to make sure that.

1:49:18.790 --> 1:49:21.70
Dugal, Tanya (DPS)
The nodes are being charged for their usage.

1:49:22.890 --> 1:49:27.190
Dugal, Tanya (DPS)
And there's some equations and some other rate cases. I think National Grid for sure and I said.

1:49:28.430 --> 1:49:34.660
Dugal, Tanya (DPS)
That have added those into the tariffs for billable hours.

1:49:38.940 --> 1:49:39.830
Frosco, Jacqueline
And I think that.

1:49:39.950 --> 1:49:42.180
Frosco, Jacqueline
And I hear you. I.

1:49:48.560 --> 1:49:48.770
Dugal, Tanya (DPS)
Right.

1:49:52.470 --> 1:49:52.810
Dugal, Tanya (DPS)
Right.

1:49:43.180 --> 1:50:1.610
Frosco, Jacqueline
Yes, Jonathan. OK, I hear what you're saying. I think we have to take that back and look at it as it relates to what we have right now. And we're not, as you're reporting out, accounting for that. And I think we have to look at who were to pursue that. How would that even fit in because it's their asset.

1:50:2.190 --> 1:50:2.750
Dugal, Tanya (DPS)
It's there.

1:50:2.570 --> 1:50:13.20
Frosco, Jacqueline
Yeah, as of today, we didn't even know Warwick had installed the notes. So I think it opens up a level of complexity, but it is outside of what we have in place right now.

1:50:13.830 --> 1:50:15.80
Dugal, Tanya (DPS)
Right. And and then?

1:50:14.670 --> 1:50:16.980
Frosco, Jacqueline
As Cheryl, I think that you are going to give comment.

1:50:17.660 --> 1:50:30.140
Dugal, Tanya (DPS)
That's really something that O and orange staff can take offline, but for the participants in this group, I want them to be aware that there are additional energy use costs generally associated with the nodes as they use about a kilowatt. There's not a lot.

1:50:30.900 --> 1:50:37.70
Dugal, Tanya (DPS)
Or one Watt extra. So uh, one Watt more at the time. But there are.

1:50:38.440 --> 1:50:40.830
Dugal, Tanya (DPS)
I think some companies have updated their.

1:50:42.870 --> 1:51:11.780
Dugal, Tanya (DPS)
Terms of terms and agreements for identification and reporting, but how the some of the other companies work and I really wish Sandra was still on, but how some of the other companies do it, as when the customer has to report what they've installed and provide the manufacturer specs for the lights and the identified the usage of the lights that they're installing for customer owned assets, they include the node as well and they aggregate and sum the total kWh use to provide the billable kilowatts and then multiply that by the hourly charts.

1:51:12.820 --> 1:51:13.40
Dugal, Tanya (DPS)
And.

1:51:14.70 --> 1:51:26.830
Dugal, Tanya (DPS)
And I get appreciate that. Ohh and our just has a lot less customer owned lights than like say National Grid and some other places at this point, but we could definitely take that offline and and make sure that when there's an inventory of how.

1:51:27.790 --> 1:51:33.720
Dugal, Tanya (DPS)
Of what use is there are and how other companies are doing it that we we make sure that O&R can?

1:51:34.820 --> 1:51:37.30
Dugal, Tanya (DPS)
Verify their their current operating.

1:51:38.40 --> 1:51:38.760
Dugal, Tanya (DPS)
Practices.

1:51:39.500 --> 1:51:50.170
Ruggiero, Cheryl M
Tanya, thank you for that comment. Because like we said, we're surprised about Warwick hearing that. And I think we could say that technically per the tariff, the company wasn't made aware of this, so.

1:51:59.570 --> 1:51:59.880
Dugal, Tanya (DPS)
Uh.

1:51:51.550 --> 1:52:3.580
Ruggiero, Cheryl M
You know, it is still they don't own poles on overhead fed lights though I think there is a violation of the tariff currently for installing them because we weren't given the technical specification. So I think it's something we have to talk about internally.

1:52:6.240 --> 1:52:10.470
Ruggiero, Cheryl M
Oh, yeah, yeah. I don't think there was any malice.

1:52:15.460 --> 1:52:15.900
Ruggiero, Cheryl M
Yeah, yeah.

1:52:4.60 --> 1:52:16.370
Dugal, Tanya (DPS)
Right. And it could have been an oversight accidentally. And given that this given that this, I don't wanna keep taking too much from there. No, no, I get that. But given it's a recorded one, I don't wanna keep. I could take that time.

1:52:16.910 --> 1:52:17.470
Ruggiero, Cheryl M
Sounds good.

1:52:24.670 --> 1:52:24.960
Dugal, Tanya (DPS)
Sorry.

1:52:20.200 --> 1:52:27.160
Caban, Eric D
They, Tanya, one. One more thing. This is Eric and Ben. I I think you misspelled your e-mail address.

1:52:29.450 --> 1:52:31.10
Dugal, Tanya (DPS)
Oh, shoot, I'm so sorry.

1:52:31.800 --> 1:52:32.930
Dugal, Tanya (DPS)
Huh, I'm guessing.

1:52:35.980 --> 1:52:36.410
Dugal, Tanya (DPS)
There we go.

1:52:42.70 --> 1:52:42.880
Dugal, Tanya (DPS)
Thank you, Eric.

1:52:45.280 --> 1:52:45.810
Caban, Eric D
You're welcome.

1:52:52.270 --> 1:52:52.960
Frosco, Jacqueline
Thank you everybody.

1:52:52.70 --> 1:52:53.430
Jonathan Aronoff
Alright, thank you everybody.

1:52:55.560 --> 1:53:15.970
Jonathan Aronoff
There are no other comments or questions. Uh, we will adjourn again. Please submit any follow up comments or questions to the e-mail address on the displayed on the slide or if you have questions specifically for DPS, please reach out to Tanya.

1:53:17.360 --> 1:53:19.240
Jonathan Aronoff
Thank you all. We will conclude.

1:53:19.910 --> 1:53:20.700
Dugal, Tanya (DPS)
Thank you. Bye.

1:53:23.540 --> 1:53:24.140
Jonathan Aronoff
Thanks everyone.

1:53:23.480 --> 1:53:24.230
Frosco, Jacqueline
Thanks everyone.