

NYSERDA'S 124th PROGRAM PLANNING COMMITTEE MEETING

June 24, 2024

Clean Copy of Transcript

Sara LeCain:

We are the recording's up if you'd like to start.

Sherburne Abbott:

Okay, great. Good morning and welcome. I call this meeting to order a notice and agenda for this meeting was provided to the Committee Members in press on June 13, 2024. This meeting is being conducted by video conference and I too am appearing by video conference teleconference and I apologize to the Members, especially to new Members of the Board. I would've liked to have been there in person, but their extenuating circumstances that the Authority will post a video and transcript of this meeting on the web. To confirm that we have a quorum, I would like each of the Committee Members to introduce themselves. I'm Shere Abbott, Chair of the Committee.

Richard Kauffman:

Well maybe in Albany. I'm Richard Kauffman. I'm Chair of the Authority and I'd like to welcome Jen Hensley and JoAnne Hewitt as our new Members of the Board.

Jay Koh:

Here in New York. In NY Green Bank Facility Jay Koh Member of the Board and Member of the Committee and welcome also to the new Board Members. Looking forward to meeting you in person.

Charles Bell:

Chuck Bell, Member of the Committee, Member of the Board. I'm also welcome to new Board.

Sherburne Abbott:

Okay, well welcome to the new Board Members. I have to look forward to meeting you and thank you all. The first item on the agenda is the approval of the minutes of the 123rd Committee meeting held on April 29, 2024. Are there any comments on the minutes?

Richard Kauffman:

I have none.

Sherburne Abbott:

Hearing none. May I please have a motion to approve the minutes?

Jay Koh:

Move to approve.

Charles Bell:

Second.

Sherburne Abbott:

All in favor?

Members of the Committee:

Aye.

Sherburne Abbott:

Opposed?

The minutes have been approved. The next set on the agenda is the review of and approval of the Program Planning Committee Charter pursuant to the Public Authorities Accountability Act of 2005. Each of the Authority's Committees adopted Charter setting forth each Committee's responsibilities. One of those responsibilities is to periodically review its Charter and determine what if any amendments need to be made. These recommendations are then presented to the full Board for consideration and approval. A copy of the current Committee Charter was included in your meeting package. Counsel's office continually monitors relevant guidance from the Authority's Budget Office, the Comptroller's Office legislation and other Authority practices to determine whether to recommend any modifications other Authority's reviewed include the New York Power Authority, Long Island Powered Authority, Dormitory Authority, and the Environmental Facilities Corporation Management is not recommend any changes to the Program Planning Committee Charter at this time? Are there any questions or suggested changes to the Charter? Peter, could I ask one question?

Peter Costello:

Sure.

Sherburne Abbott:

I can't remember when it was, but we had a discussion about the whether or not the Charter conforms to the responsibilities of the Authority under the Climate Act.

Peter Costello:

Yes, yes.

And we made changes throughout to reflect that.

Sherburne Abbott:

That's what I thought. Okay. Yes. Just wanted to clarify that this Charter does reflect that additional change.

Peter Costello:

Indeed.

Richard Kauffman:

So I wonder for next year whether we can widen the aperture of other organizations because our programs don't exactly align as easily with some of the peer organizations in government. So I don't know, we'd have to go outside of government. I dunno how easy that is to do, but

Peter Costello:

We can certainly look into it. Yes.

Sherburne Abbott:

Any other suggestions or questions? Hearing none, may I have a motion recommending approval of the Program Planning Committee Charter?

Jay Koh:

So second.

Sherburne Abbott:

All in favor?

Members of the Committee:

Aye. Aye.

Sherburne Abbott:

Opposed? The Program Planning Committee Charter has been recommended for approval. The next item on the agenda is an update of the Authority's programmatic progress and plans. Jennifer Meissner, Director of Performance Management will discuss this item, Jen.

Jennifer Meissner:

Okay, great. Doreen did you want to say any words ahead of time here or just kick it right off?

Doreen Harris:

No, please, please.

Jennifer Meissner:

Okay, wonderful. You introduce yourself. Will do and thank you. Yes. Jennifer Meissner, Director of Performance Management here at NYSERDA. So it's great to be talking with the Committee this morning. This agenda item is really our annual progress update to the PPC where we're building on requests actually that came from Members over the years to relate NYSERDA activities to the statewide Climate Act goals and to provide some added context there. So in the interest of time, we're only focusing on a few of the Climate Act goals, not certainly comprehensive. And then we do have a section of this discussion that we wanted to devote to market transformation and how that achievement is helping meet the really ambitious stake goals. And I'll just note that the Board is also considering NYSERDA Public Authority's Law Operations and Accomplishments report at its today, which includes an accounting of what NYSERDA has done in the past year.

So certainly that is related to this overarching progress presentation that we're giving you here. We can move forward into the agenda slide. I think we've covered that. We'll try to get through the material and of course would welcome discussion. And I will just say moving into the progress update that it is a helpful framing for NYSERDA progress in light of the overarching Climate Act goals. NYSERDA is definitely a very significant contributor toward achievement, but NYSERDA is one of many entities providing supportive actions to meet these goals and we also need to see broader market-based change to be fully successful. So let's move forward. One two more slides. Actually one more. The Climate Act goal to achieve a 40% reduction in emissions by 2030 is really the main goal that provides some helpful framing for this. So the 2023 Department of Environmental Conservation Greenhouse Gas Emission Reduction inventory report provides our current view of progress and really that's represented in the 2021 bar of the chart that you see in the 2021 benchmark.

The total statewide emissions were 368 million metric tons and that is around 10% below the 1990 baseline level of 410 million metric tons. So therefore we have our little progress gauge across the top on all these slides that represents about 26% of the Climate Act requirement at this point in time. Really thoughtful programming of available funds and market movement are needed to meet the 2030 goal. We can just see the ambition here to kind of going down to that level of the 2030 goal. And I will note that buildings in transport are the bottom two sort of portions or the largest segments of those benchmark bars that are shown in the graph and they do represent a significant part of the decarbonization challenge ahead of us. Let's move to the next slide and touch on renewable energy. The main renewable energy goal in the Climate Act is to achieve a 70% renewable grid by 2030 and then beyond that a 100% zero emission electricity grid by 2040.

And despite market dynamics in the past year leading to a somewhat reconstituted development pipeline, the state is making good progress toward the goal with the operating and pipeline renewable energy making up 53% of the 2030 load. So on our little progress indicator across the top, that's about 76% of that 70 30 goal. And then when we include the most recent year one awards that adds 5,200 gigawatt hours and sets us at 56% of that 2030 estimated load, at least half of this progress comes about directly from NYSERDA activity and NYSERDA has accelerated procurement under the governor's 10 point action plan. The real challenge is making sure that the build progress proceeds and NYSERDA is providing a lot of supply chain ecosystem support in that regard as well, including workforce training, port infrastructure RD to support the industry. I'll note that beyond this brief progress update, there is an upcoming CES review that's expected to provide a fuller analysis of progress and the trajectory of the state toward meeting that 70 by 30 goal. So we can refer to that up and coming review for further information.

Richard Kauffman:

Jennifer, excuse me for interrupting. So the part that we're not supporting, how much of that is LIPA or other state entities and how much is the voluntary market or whatever else?

Jennifer Meissner:

Well, yeah and know I think that George is on also for NYSERDA potentially to help chime in here, but we can see the portions a little bit here, which are not super well differentiated, but

there is a lot of baseline sort of renewable that comes about through the hydro power that's shown in the graph. The other portions of LIPA support or wind, I don't have the precise numbers, but wondering if others might chime in on that, we can certainly circle back and provide that.

Richard Kauffman:

Be the option.

Doreen Harris:

Right? Yeah, George unfortunately is not on due to illness.

Jennifer Meissner:

Oh, sorry about that.

Doreen Harris:

But I would just say as a general matter, the voluntary market is de minimis relative to the amount coming specifically from the New York Power Authority in providing and generally our baseline of hydro as well as the hydro imports that are coming in from Canada.

Jay Koh:

So maybe two quick questions here if I could. One is the 2030 forecast load is lower than the 2022 forecast actual load. I'm just wondering if any of these projections have been adjusted for additional demand that's forecast now or that we seem to be experiencing because of AI and other energy consumption that may not have been originally understood as a possible factor back in whenever the projections were created.

Doreen Harris:

Yes, Jay, this load that is utilized here is the load that was utilized in the Public Service Commission proceeding taking up the climate at goal of 70 by 30. As Jen mentioned, there is a statutorily required program review that is due in 2024 and part of that review will be reviewing the load forecast. To your point, since that year we have seen that load did take into account some amount of electrification and certainly the impact of the efficiency programs, but certainly we're seeing a preponderance not only of large loads that could be considered in the context of that review AI and others economic development load as well, but in addition, the scale of electrification, the pace of electrification is going to be part of that load forecast as well. So all that to say, if the denominator changes, understandably, the numerator will necessarily change.

Jay Koh:

Great. And then the second question is just regarding resiliency and then forecast changes in potential sources of renewable power. I think there's going to be pretty tremendous demand for additional, I think distribution and transmission across the US including likely New York state. And then there's been some variability in hydropower generation recently because of the increasing drought and heat variability that we've seen. And just wondering how systematically that's incorporated into this analysis.

Doreen Harris:

Do you want to jump in on that?

John Williams:

Yeah, I would say that Jay, this is really looking at performance of at least the facilities that we depend on over the past year and it's not necessarily forecasting out based on those characteristics. I do think there is some new learning that needs to be done as to the performance of resources over time. Certainly our climate impact assessment that was completed last year is giving us some good indications as to how we should be thinking about the projections and the contributions of various types of systems over time. So we'll begin to start integrating that into forecasts going forward. Certainly the hydro issue has opened some eyes this year and we'll just need to be working with the suppliers of those resources to get a good understanding how they're approaching the contingencies that they would need for the performance of those resources considering not only their contracted obligations that we will look to see in the future, but also the anticipation for continued market transactions to be happening with those resources over time as well. So a lot more learning to be.

Jay Koh:

Great. Thank you.

Jennifer Meissner:

Okay, great. So next slide pertains to distributed solar. I think we can move to that one. The distributed solar goal is to see 10,000 megawatts of installed capacity by 2030 and NYSERDA NY-Sun program is one of the longer standing portfolios that has really contributed substantial progress to that state goal, which actually represents an expansion of the original climate echo, which was 6,000 megawatts by 2023, I'm sorry, 2025. So the total state progress of the installed and pipeline capacity is currently 88% of that 2030 goal. We have seen continued year over year growth in the statewide installed solar capacity and 2023 was the most active year of solar deployment in the state overall with NYSERDA supporting 748 of the 885 megawatts that were installed as a state. New York continues to rank very high nationally in terms of community solar and also distributed solar capacity that's been installed also in terms of supporting solar jobs and there've been many drivers beyond solar incentives here that have led to success included training, training of the workforce, growing that installer base, promoting quality installers, which you'll hear a little bit about later and important policy drivers as well.

And obviously another major factor in New York success is community solar, which is bringing about scale and lower cost in the state. So related,

Richard Kauffman:

Sorry, I just have a question. So in terms of VDER and everything, can you just talk about how VDER is working out and whether the support that we're providing is going down over time because of improvements in VDER?

David Sandbank:

Yeah, I think Richard VDER has been a smashing success in the country. There's been other states that are trying to do it but are struggling to get there for whatever reasons. So when I travel

outside of New York, that's really one of the first things I hear of is how successful the value of distributed energy resources are. And at it first rolled out, there was a few road bumps we had to get over and smooth out, but once they were smoothed out, the financing community is very comfortable with it and it's providing solar developers and storage developers with where and when they need to provide that electricity. So it's of the most value to the grid. So it really is the backbone of the success of NY-Sun I would say right now.

Doreen Harris:

And it's afforded to Richard's point about reducing NY-Sun incentives. It's had that effect as well

David Sandbank:

Very much. And then

Doreen Harris:

X

David Sandbank:

Meissner's team did a study on sort of the amount of electrons we're producing per kilowatt is getting greater and greater, which is an untold story within the incentive because the incentive is getting more kilowatt hours or a kilowatt based on the efficiencies of how solar panels are made these days and bifacial panels. So when you look at it from many different vantage points, the incentive is going down and production's going up and it's a good story. Thank you. Sure.

Jennifer Meissner:

Okay, thank you. Relatedly on energy storage progress is a bit more nascent with the original three gigawatt goal by 2030, but just last week, the PSC has approved a new framework for the state to get to six gigawatts by 2030. And currently our progress stands at 30% of the original goal when considering both the installed and pipeline capacity So far, about 359 megawatts has been installed statewide and I sort of supported about 187 megawatts of that installation across more than 1200 projects. But really NYSERDA has a large pipeline of contracted projects representing 541 megawatts that is the yellow part of the bar shown at the top and just touching on activity since the summer 2023 energy storage fires that occurred in response to the governor's directive, NYSERDA and the division of Homeland Security and Emergency Services led up an inter-agency fire safety working group and the group undertook many tasks to address these events including examining testing for contaminants, conducting a thorough review of codes and standards and identifying needed updates there. And also NYSERDA took the lead on field inspections of all in-service commercial energy storage projects to identify issues there and we've done about 50 or so field inspections to date with plans for that to continue.

David Sandbank:

Can I expand on that for a second?

Jennifer Meissner:

Yes. Oh, I'm sorry. This slide was forward also on the screen. Yeah,

David Sandbank:

Please. We just released a New York City block five for energy storage, retail storage, which is five megawatts and less. Usually the profiles about a five megawatt battery with four hour duration and we procured 118 more megawatts that's not on that slide of late stage development in energy storage. So I think that's a really good success story there. What's that roadmap? And obviously you might've heard that the Public service commission just approved the six gigawatt by 2030 storage roadmap and that's an additional procurement of 4,700 megawatts across bulk storage, retail and residential storage projects to be implemented hopefully by the end of this year so that we can make more progress and that 29% grows or 30% grows to a greater percentage because of the new roadmap and also because of the IRA providing a 30% tax credit to storage, whereas there was 0% before. So we finally have some tailwinds on our back to get there.

Richard Kauffman:

I've got a question. We have these maps here show deployments. So how do these maps relate? I mean I think I'm trying to be diplomatic. I think in the old days maybe under NYSERDA we would look at the maps as a way to think about allocating support dollars. Are we looking at these maps now in a different way? In other words, how do the maps relate to the grid? So you're talking about the install capacity by county map there? Yeah, no. Well, I think within each program there are geographical requirements some more than others. For instance, in the storage roadmap the order came out and there's a certain percentage that has to be downstate IE zone J and K and in disadvantaged communities, I'm not sure I understand the question. Holy Richard. Well I guess what I'm asking is whether when we for example look at storage, are we deploying storage in areas?

You talked about veer and having distributed generation in areas which benefit the grid as a whole. I guess another way I'm asking is are we doing the same thing with respect to storage?

David Sandbank:

Storage? Yes. Sorry, I misunderstood the question. When we did built the roadmap, we did a whole study on where we felt the megawatts would fall. And so we are probably going to see the storage roadmap include about a 70% ratio downstate in the 30% ratio upstate. And then what it showed that when we had more towards the 2040 time period, then that would shift more to upstate as land-based removals needed the support there. So for the most part we are looking at a lot of the deployment to happen in zone JK and announce Valley.

Doreen Harris:

I think it's also important to note that we're looking at both short and long duration storage. I don't know if you want to speak to that, but there's an evolution necessarily for those very reasons of grid value in a highly decarbonized environment.

David Sandbank:

Yeah, the need for long duration storage, we sort of define it in the roadmap as double digit hours and greater is not necessarily needed by 2030, but is definitely going to be needed by 2040 and 2045, but you can't just snap your fingers and deploy long duration storage. So the roadmap carves out about a thousand megawatts of long duration storage to happen within the solicitation

annual solicitations for bulk storage so that we can test the market and get some long duration storage out there.

Richard Kauffman:

JoAnne

JoAnne Hewett:

Are the current energy storage unit, mainly lithium based, the fire safety,

David Sandbank:

So most everything if not everything outside of long duration is lithium ion. We're doing a lot of really I think positive work here in New York on the fire safety working group and a lot of headway, which is not all in that one slide. There's a lot of other things we're doing there recognizing mostly that we just submitted about 15 code additions and edit recommendations that dishes and Department of State and Office of Fire Prevention and control are all a part of and that's most likely going to take those recommendations and put them into 2025 code. But even before that, I'm working with the LSR team and our team so that the most critical recommendations are going to be in our program mandatorily in our programs so that all the new deployment out there will be with much greater oversight and with the lessons learned we had from fire safety working, we're moving forward starting today.

Doreen Harris:

And in the meantime one thing we will talk about is a Committee from time to time is our investments and innovation and I think from the perspective of different chemistries, we are investing actually rather heavily in different technologies including iron oxide as a major chemistry we're considering for the future. And the long duration technologies we'll need. Exactly.

Jay Koh:

One question here is are we capturing in any way metrics of any kind and how energy storage supports resiliency of the energy system against what's now increasing variability of demand and supply of energy into the system? Just because I think that is a core element of ER's broader strategy. It is a massive clear benefit I think of energy storage deployed appropriately and would be helpful just as we kind of think about incentivizing or managing the resiliency and adaptation of our grid and our energy system towards this now increasingly complex environment.

Jennifer Meissner:

Well thus far, I mean we're completing a study right now looking at the energy storage systems that have been installed to date and seeing how they're being used by those customers and that will be completed I think in the coming months and published on NYSERDA's website. I think that there's a lot more learning to happen in terms of the use of storage now and use of storage going forward in the future. I don't know David if you have anything to add to that, but we do understand usage currently for the storage that has been installed to date.

David Sandbank:

Yeah, I mean I think that the three flavors of storage we know right now and that is in the roadmap is bulk storage and then there's retail storage, retail storage, Richard AI following the value stack, right? For the most part, unless there's a non wires alternative program it's in, but it is going to follow the capacity DRV and energy market and then there's residential, pardon me, we have 200 megawatts of residential deployment that we're going to do in the new roadmap and that's primarily going to go towards obviously homes not only for their own resilience of when the power goes out and giving them power when needed, but also what we would like to do is work with the utility companies is now especially that we feel in about a year we'll be able to build indoor storage in New York City that we're going to work with the utility companies to figure out how to deploy these 200 megawatts in homes so that it provides extra benefits to the utility territory as a whole, not just for that one home. And it could be a virtual power plant, it could take any different type of flavor or shape, but that's really what we're going to push hard for is working with utility. So it's not just a one home resiliency but a utility wide resiliency. As we deploy across the state,

Jay Koh:

I strongly encourage trying to figure out if there are approaches on the metrics side we're capturing that we're looking at overlays where we're seeing increasing amounts of power demand because of heat events or air purification events that are being driven by the climate impact now we're going to see continue to unfold. And also looking at the benefit of having that 200 megawatt capability or in the face of hydropower shortfall or other shortfalls on our renewable supply side. Both of these are going to be factors that I think are inevitable between now and 2030 and 2040. And the question is can we begin to measure them in a way that enables us to be more efficient, deploying our resources to serve what that environment's going to look like in the next five and 50.

Jennifer Meissner:

Yeah, that makes sense. Thank you.

Okay, so we'll move to the next slide. Just moving along here, the next goal that we feature relates to disadvantaged communities and the target to achieve a minimum of 35% of the benefits of investments in those disadvantaged communities. Understanding of our progress as a state is moving forward and over the past year and I partnered with Department of Environmental Conservation to finalize guidance that state agencies will use in order to report on their D spending and benefits in a consistent way. And that guidance was released for public comment earlier this year. We've received those comments. We are working to address those comments and finalize the guidance and we expect statewide reporting to begin in 2024 facilitated by NYSERDA with regard to our own progress, NYSERDA will drive its portfolio to deliver 40% of the benefits of investments to DACs and as the DAC criteria was finalized by the climate justice working group earlier last year, and I sort of worked to incorporate that final criteria into its operations, preparing mainly our data systems and our processes, getting all the geocoding of those place-based investments set up and also bolstering through the program's, meaningful engagement with underserved communities and building our own internal capacity as well to support that work.

And in 2023 and early 2024, we made our first reports to the public service commission on disadvantaged community investments within our clean energy fund programs for the period of 2020 through 2023. At this point, you can see in the little donut chart at the top right that we've managed to geocode 95% of our 2.3 billion in place-based investments through all of the CDF portfolios in that timeframe. And so far as a baseline gauge of progress overall, 36% of those investments or 842 million are occurring within disadvantaged communities and going to low income residents. So all of the major portfolios are making strong contributions as you can see in those little bar charts at the bottom. We do expect, especially in NY-Sun and near Green Bank, that those contributions will rise as we are moving into the coming years and able to count more specific DAC investments on the horizon. So this is a baseline snapshot of a major portfolio that we wanted to share at this point in time.

Richard Kauffman:

Are we going to be able to or does the data going to, because some of the benefits are economic development, some of the benefits are health related, so if there are less fossil plants are because of say storage that's deployed in an area or other VDERs deployed that a power plant shut down, there are benefits that that's different than the benefit that would come from an energy efficiency project that somebody that lives in that community benefits from. So we're going to be able to break this apart to understand when we talk about investments. I see it's both. You understand the question? Yeah.

Jennifer Meissner:

Yes. So the main benefit that we're looking at here is the dollars invested or spent, but the reporting guidelines speak to a whole host of co-benefits as well that we're able to estimated calculate based on the spending activity and the benefits associated with it. So for example, the reporting guidance will translate benefits to air quality from related emission reductions, air quality improvements. We also will translate benefits in terms of dollar savings to communities. And I would say that that guidance for all the co-benefits that it does include now is probably a first cut and will be revised and will evolve as we're able to take account for more co-benefits. We also recognize as well that some of these benefits need to be explained and described in maybe a bit more of a qualitative manner using some data that we have to kind of look into a case study or tell the story more deeply about specific investments.

Richard Kauffman:

I don't, maybe at some point we talk about that. I understand the logic of and why we have to do it on the basis of dollars. I wonder if there's another way of describing a term other than co-benefits. We know we're measuring the dollars, but really what we're looking for are the benefits,

Jennifer Meissner:

Right, as opposed to the

Richard Kauffman:

Benefits being co.

Jennifer Meissner:

Right.

Great. Okay,

Thank you. Okay, so the last two slides in this part that I know we probably have to move pretty quickly through our related to the energy efficiency goal of 185 TB two site energy savings by 2025. State goal attainment really depends on NYSERDA activities, but also activities of utilities, the Power Authority's and historic and ongoing EE programs from the available data that we have, which is not 100% complete, but a snapshot at this point shows that we are at around 74% of that goal or 136 TBTs represented through the installed in pipeline activity. We do see that inflationary pressures and supply chain issues have been documented by many program administrators including NYSERDA as affecting progress to a degree. And we even see for example, broad market indicators like the producer price index up around 25%, which indicates overall inflation in the cost of inputs to construction.

And so NYSERDA portion is shown in the little donut off to the side where we're delivering on 63 TBT and 86% of that is installed and in the pipeline now. But the important point is about what's left to achieve and what we have ahead of us in the coming years, which we really are counting on market transformation savings coming about from our activities within the CEF especially. We refer to these as indirect savings and we do have a bit more information in the next slide to round that out. I'll be very brief what we expect a third to a half of our overall savings in the CEF to come from indirect savings as we move through to 20 20 30. That is, and you can see that visually in the small chart. It does take time for us to be able to document those market effects and do all of the independent evaluation to understand how we quantify those.

But we did include some early proof points and examples here in the little table. For instance, the efforts in high performance codes, the efforts to support high performance codes, that is include building competitions which provide proof points that this can be done, workforce development to train code officials and others, and also the policy and regulatory analysis and support activities. And here over the years we have shown through the independent evaluation work about 3.4 TB twos of energy savings that will count toward this goal. So I know we're going to get into some other examples in the later slides and want to make sure there's time for that, but this is a significant portion of NYSERDA's delivery that we wanted to touch on.

Richard Kauffman:

And Jen, you talked about the beginning that when we look at the overall state goals, one of the key areas is energy efficiency. So when we look at this chart of energy efficiency against our target, our target is only a tiny percentage of what is needed for this overall state. So I don't know if we can, I know that we can't have responsibility for the whole state, but we should actually fill the responsibility for the whole state. In other words that the program, and I know we're going to talk about this next, that the market animation make this point that that's what's going to be required to achieve the overall goals. We really should have a bar chart that shows where we are as a state against that overall objective because I think that I really needs to really feel the obligation for that market animation. I don't know how else it's going to happen.

Anthony J. Fiore:

Does feel that very much Richard. It's a weight on all of our shoulders every day. And if we skip ahead to two slides we could talk about this. I think we've talked about this quite a bit and we understand that even with the historical investment from the federal government, that incentives along will never get us to where we need to be to reach the scale, especially in the time that we need to reach it. And so NYSERDA certainly does have a unique role in the state in engaging the market to animate it and eventually transform it. And that's why many of NYSERDA's programs are organized around or include elements of market transformation. And when we talk about that, we're really talking about that longer term effort to spur that systemic change in the market where it's then acting on its own so that we have durable increases in shares of clean energy products and services.

We are looking at the full spectrum of activity to influence the outcomes and move the market adoption along. And we've talked about some of the typologies here as well in the past. But if you look at I think data, the provision of robust foundational data so that the market can make informed decisions on where they invest, if you look about that supply chain engagement, that's really important. If you look at workforce development, that's extremely important as well. And creating that kind of transactional history around financing so that we can bring private lending institutions further into clean energy economy. So with that, the following slides, we're just going to go over some of the climate goals and spotlight a couple of our programs that are doing that type of activity to try to catalyze the market just as you spoke about Richard. And so I'm going to have each of our respective business unit leads or vice presidents speak to each of these. So I'd like to move to the next slide and turn it over to Susanne DesRoches to talk about a spotlight program within the buildings portfolio.

Susanne DesRoches:

Thanks Anthony. Hey everybody. Sorry startle the Board Members. I'm sitting in the back of the room here,

Richard Kauffman:

Definitely sitting in the back of the room. It's a safe space there. I can tell

Susanne DesRoches:

It's a safe space. So there's not very many of us here in the New York City office today. So wanting to cover buildings of excellence, and that hits on a number of the points that Anthony just made. Really, this is a signature program from the buildings portfolio. It provides purposeful demos and these lead to market uptake and also to regulatory changes, which I'll talk about in a minute. So buildings of excellence, really the purpose here is we want to demonstrate that this is possible and that these market practices are feasible at cost or cost parity to other types of new construction. So another piece of this that's proven to be quite important is that we're providing this data to the market. Every project that's in the buildings of excellence program is fully, the data is made fully transparent to the industry on our website, it's cost data, it's feasibility data and that's proven to be quite useful through some of the other work that we've been doing as well as sister agencies and municipalities like New York City.

So we really launched the program to get the industry comfortable with high performance buildings, but we've continued to, as each round happens, go to a passive house standard. So very highly efficient building. We've integrated all electric technology into these buildings again to show that this is feasible. And we've seen that developers that do this multiple times really get quite comfortable building these types of buildings. It has driven other regulatory changes. So we now have the zero emissions new construction law statewide. There is also a similar law in New York City and we've utilized this data in our energy code update work so that we understand how these buildings can be built and how this works statewide. So really where we're headed with this is to use this building's of excellence competition process and continue to ratchet it up at each round. So what is a building in 2035 need to look like? How is it fully resilient? Is it grid interactive? What types of technologies can we be working with innovation on to then demonstrate in these buildings? So really we're working on continual updates to the program so that we can continue to lead the way on these demonstration projects.

Anthony, I think are we just going to go through these slides?

Anthony J. Fiore:

Thanks Suzanne.

Jay Koh:

Can I ask a question?

Anthony J. Fiore:

Yeah.

Jay Koh:

So my question here is we hand wave at resilient buildings, is there a metric, is there a way we can report, this is a way we can describe other than, hey, these buildings are better. How is it better? Particularly because these heat waves that are now going to be a continuously expanding problem for the entire planet, particularly for the most vulnerable, which we're directing a bunch of the Green Bank activity towards an overall programmatic activity at NYSERDA. And so I'm just wondering, can we be to approach describing, especially since these are transparent approaches that set standards that create a mechanism? So in sort of winning the standards by setting the standards up so that you really do understand look up building like this, then when there's a huge heat wave or storm or a fire or some disruption or air quality issues that I am in a much better housing situation or corporate or industrial operation that's meaningfully measured and not just anecdotally like my building's better than your building, right?

Susanne DesRoches:

Yeah. And I totally appreciate that point and we are definitely looking to both standardize what we ask for a building to do as well as provide the information as to how the building performs going forward in using future looking climate data. We're still working on how to incorporate that into the program. Just to pause to say, right now we focus buildings of excellence on multifamily buildings. So we aren't doing all types of buildings but a subset, but we are working on that guidance for future rounds.

Jay Koh:

I strongly urge the development of a quantitative standard for resiliency if that is part of our objective here. Understood. And as soon as possible and not let the perfect be the enemy of the good, someone will set this standard. We have massive programs aimed at this and we do a lot of hand waving around it. And so without being too much sharper about it, I think I'd love to see an update on what the standard is and how to quantify it in a way that enables us to direct our programs in a way that will demonstrate efficacy and efficiency. Because otherwise we're just going to continue to have this as an adjective that's really nice to mouth as we so often and it will not result in efficient development. We're going to give huge amounts of funding directed at these specific sets of challenges. We are now going to just absolutely see the unfold act of this on lives. And so just knowing how many buildings are going to help survive like a massive heat event would be helpful to know at a minimum. But also Hurricane Sandy is not the last that we're going to see and whether these buildings perform better or worse should be more than an anecdote.

Susanne DesRoches:

Understood. Thank you. Thanks for that comment.

Lindsay Greene:

Can I ask a question? Sorry Lindsay, I joined a little late. Two questions. One, just to add to Jay's comment about how we're tracking and defining standards In all of the reporting you get from the building owners, will we be able to have a 10 20 year history of building performance, both in terms of how are all these newly electrified heat pumps and other things installed, do they actually still work five, 10 years from now? And what is the end user experience? Both from I think a pocketbook and a reliability standpoint? It kind of goes to the notion of retail success, but if people living in the buildings feel the benefit, they have a reliable air conditioner, they have a reliable heater that withstands a stream temperatures and everything still works 10 years on that, I think that is going to matter for the longevity of adoption.

I think any of the older vintage buildings that we can point to that show that will help with the adoption if you can figure out the public storytelling, particularly when you get away from institutional building owners just trying to do the work. So that was I think more of a comment. And the second one is as the program is happening, is there a pattern in terms of the manufacturers and the partners that developers are working with, are they rising to the challenge effectively in terms of what they are delivering from a construction standpoint? Do we see the right response or are people able to build the things that they want to build? Are they able to get the devices that they say when they apply based on supply chain impacts or anything else? Do we know that kind of information?

Anthony J. Fiore:

Yeah, I think we'll be tracking that information forward.

Susanne DesRoches:

Jen, do you want to jump in on

Jennifer Meissner:

Sure. On the first part of the question? Yes. So we have our independent evaluation measurement verification efforts that do very robust sampling of the projects that we fund to measure and verify those energy savings and make sure that the technologies are functioning as expected, that they're leading to the expected benefits for customers. In some areas where we've been supporting technologies and they're out there operating for a long period of time, like solar pv, we even include a, what we call a persistence element to those studies to look and see after many years are they still delivering and performing. I would say in addition to that, that there's also some checkpoints earlier on. We do in many areas, check in with the customer through customer satisfaction surveys just to make sure that everything is as expected on their project given that early experience. And we also have quality assurance that we apply to many of our programs to go out and inspect, make sure that the measures installed are as expected, that the workmanship looks good, safety aspects are inspected as part of that process. So we have a lot of checks and balances, but certainly it is top of mind.

Anthony J. Fiore:

Also, you're jumping into the next slide and David's going to talk a little bit about one of those extra programs, so maybe we could turn to that.

David Sandbank:

I'll give it a little bit of giddy up because of time. Let me know when the slide could advance please. Thank you. Okay, so this is talking about what I think we have a really good program with quality assurance and NY-Sun is a partnership. And what this is about is with the massive amount of scale up in the state of New York through distributed solar, primarily looking at small commercial, but even the residential market, we want to make sure that when we provide an incentive and for solar as a whole, that these projects are built with quality and to build with qualities for anyone who hasn't tried to do it themselves, much harder to do than one would think and has to do with the system and a quality assurance measures that you have to take within that company. And so we decided with quality assurance that we are going to put an emphasis on quality and provide each field inspection that we conduct, which is many of 'em throughout a year with all the solar installers with a score on each one of those projects.

And it's a score of one through five and those who have, what is it, gen 4.0 or something or better are going to get a designation from us at NY-Sun and NYSERDA saying you are a solar quality installer. And what that does is it really gives them skin in the game to try to achieve that high score on a consistent basis over time because what they can then do is market that and get more customers. And we want more customers working with the best installers in the state anyway. And this program has taken off wildly successful before this program even was launched when we weren't making the scores public, it was just hard to get these installers to care about it and really own it. And now they are proactive calling us up saying, well, you gave us a four, but we really think it's a five and they're really into it and proving maybe they have a point there and we work with them on that.

So when you look at these staggering numbers that 63% of all solar projects are with these highest of high quality installers is pretty impressive. And it's not to say that the ones who are not solar quality installers aren't producing good work. It's just like this is a tier above the top. This is

the people. These companies are able to do it time and time again, which is really hard to achieve. So this has been a wildly successful program with NY-Sun and quality assurance working together. It's really proving the market out. And I could see even if NY-Sun incentives go away that this program could probably continue on because it's really showing that the market could use this sort of very limited cost program that provides these installers with a high quality designation that then helps their business from what we call a neutral sort of credible resource.

Anthony J. Fiore:

We're going to be using this as a model into other areas too, including buildings and heat pump installations. I mean, this is the trust factor, right? You as a homeowner, there's hundreds of people out there you don't know who to trust. And so if we want to get adoption, we have to have that type of trust factor. And part of that also is workforce development and training. And so Adele is going to speak to that on the next slide.

Richard Kauffman:

If I could just intervene just for a second for the benefit of the new Board Members, because I think that the other things that I think NY-Sun represented in terms of market transformation, help me if I get this wrong. David was the sort of a no order but would be the solar rise program, which reduced the soft costs of customer origination for residential. It was in addition the block program, which provided a line of sight for incentives over a long period of time as opposed to the prior stop start, as well as the incentive for the industry to invest to get to scale. So by investing in the industry, both in terms of installation and other things they introduced to be able to afford the reduction in the next set of incentives. And then as we talked before about vita, which drives development in areas of certain areas of the grid, so that also reduces development costs. I just want to be sure that we have a rounded view, and I'm sure there are others, I want to be sure we had a rounded view of what some of the market transformation things that happened in renewable lit.

David Sandbank:

Thanks, Richard. I always look at it as transparency, certainty, and credibility. Those have to all be checked.

Richard Kauffman:

Sorry. Very good.

Anthony J. Fiore:

Go ahead.

Adele Ferranti:

Yeah, thank you. Hello, Adele Ferranti, Director of Workforce Development and Training, and I'm going to give you a snapshot of some of the accomplishments of our workforce development and training programs. And at any given time, we have a comprehensive portfolio of programs available to support the development and implementation of training to support the clean energy market needs and gaps. And they have to be business driven. We are looking at, as Richard mentioned, trying to figure out how to do these programs at scale and develop and support programs that will be sustained after the NYSERDA funding is completed. Some of the typical

partners we work with include SUNY, CUNY, NYPA, Empire State Development, New York State Department of Labor. We work with community colleges, universities, community-based organizations, manufacturers and others. One of the areas I just highlight is our Clean Energy and HVAC career pathway and existing worker training programs.

To date, we have awarded about \$17 million to almost 60 projects, and those projects support training for both new and existing workers. And for us, new worker training is a career pathway model where you're teaching people soft skills, technical skills, emphasis on job placement and support. Once they're in a job, at least 50% of trainees in our new worker training programs have to come from a disadvantaged community or priority population. And on top of that, we require that those programs have an 80% placement rate into either a job, an internship or advanced training. So we want to train them and support them into their next path. Another good example is our offshore wind training program that we have been implementing in partnership with SUNY. We have four projects awarded to date, and there's been a pause as the projects have paused a little bit, we want to make sure we're training people where there'll be work.

So we have four projects awarded to date at least 50% of those trainees are from disadvantaged communities and priority populations, and it's about \$3 million awarded to date. So that's just an example of what we've seen so far in the offshore wind sector. Another great program we have is designed to support large property management companies and building owners to train their operations and maintenance workers. As you are well aware, there's a lot of operations and maintenance workers across various types of buildings. We're trying to do this at a portfolio level. We have invested about \$19 million to date, and it's mostly upskilling existing workers, and there's been about 7,000 plus people trained in this program so far. So some great progress, again, developing programs in these portfolios that'll be sustained after our funding is exhausted. Finally, as we're building up this training capacity, we're working with employers through the on-the-job training program and the Clean Energy Internship Program combined. We've helped over 500 employers hire either interns or new full-time workers. And the neat thing about this is if someone hires an intern, we can provide a subsidy and if that intern works out, they can be hired full-time under the on-the-job training program with the goal of bringing workers up to full productivity as quickly as possible by training them and mentoring them on the job. So I know it's a lot to digest, but we're making some great progress in our workforce development and training programs.

Lindsay Greene:

That's great. Have you had any of the typical construction or building unions engage in any of these programs?

Adele Ferranti:

Yes. We've had a lot of engagement with the unions and we have one new

Lindsay Greene:

Program, constructive and partnership oriented engagement where they're like, yes, I want to do more.

Adele Ferranti:

For example, we've done a lot of great work with the IBW helping them develop PV training, training for EV charging infrastructure, microgrid training, energy storage training. We have a new program out that is designed just to support unions and pre-apprenticeship programs for clean energy training. We're excited about that. And another great partner that I know you're very aware of is Non-Traditional Employment for Women or new, Which is pre-apprenticeship training programs leading to union placement. Great. Great question.

Lindsay Greene:

Thank you. I feel like that's an uphill battle. So good job. Thank you.

Anthony J. Fiore:

Thanks Adele. And then if we can move forward, Andrew's just going to present on some of the initiatives under the NY Green Bank.

Andrew Kessler:

Thanks, Anthony. I'm Andrew Kessler, President of NY Green Bank. As many of financial market transformation is really the core of our mission, it's through financial market transformation, fact that NY Green Bank contributes to climate act goals. We've committed \$2.3 billion into the marketplace over about 130 transactions since inception, and that's contributed to sustainable infrastructure in New York state of almost \$8 billion in costs. We support a variety of different technologies. As you can see on the right hand side, our diversification across various technologies has increased substantially since the earlier days where we were more solar heavy. And that's obviously really important as we build out our tool chest of different technologies to affect the important impacts we're trying to make. And also statewide from a geographic perspective, our capital has been benefiting across New York state as well as previously discussed within disadvantaged communities across the state. We focus on replicability and scalability.

That's core to adoption, which is obviously how market transformation works. We've just a couple of examples in the three bullets there. CDG, solar in terms of supporting the VDER stack and getting the private sector comfortable with that is an important example of how we've been able to drive adaptation instead of bridging as well, as well as interconnection lending have been important products for us. Just an example of some, obviously we're looking at some of the ways that we can enhance some of our core target areas, including clean transportation, energy storage, and building electrification through new products.

We measure our impact through a variety of different ways. We've had multiple stages of market transformation evaluations conducted by Dunsky Energy and Climate Advisors, and in fact, we're also in the process of a regularly scheduled CEF review of NY Green Bank, and we'll be summarizing some of those past findings well through that. And we're continuing to find ways to enhance our ability to define and track market transformation. It's sometimes hard to find direct attribution. We're a billion dollar fund in a huge energy market in New York state, but I think we're going to augment some of the qualitative ways that we've historically been using with respect to the dunsky and evaluations with and find ways to inject some qualitative measures as well. So stay tuned for some of that going forward. Any questions?

Jay Koh:

I have one comment. As somebody who's on the advisory Committee, the Green Bank, from the Board perspective and the advisory Committee perspective, I think it's great to see the specific examples about NY Green Bank supports a lot of the programmatic objectives of the Authority and also applaud the continued effort to try to refine approaches on the climate resilience side of things as NY Green Bank, also its own portfolio and then future support and would continue to encourage coordination across the Authority just to develop concrete metrics, even if they're rudimentary around the resilience question. I think that's going to be increasingly critical as we see the unfold impact. Thank you, Jay. We launched the first phase of our analysis around resiliency several weeks ago, so we're looking forward to receiving some of the deliverables associated with that engagement.

Anthony J. Fiore:

That concludes our progress report.

Sherburne Abbott:

So any other,

Peter Costello:

Shere, if I could just jump in for a minute?

Sherburne Abbott:

Yeah, yeah,

Peter Costello:

Thanks. So for the good of the order and with apologies to the Committee, Shere, when I answered your question, I was referring and looking at the currently effective Charter, which does in fact include the CLCPA and Climate Act language throughout. It was approved in October, 2023, but after I answered that question, I was informed that inadvertently in the Committee's package was the just prior, it doesn't include it.

Sherburne Abbott:

It doesn't include the new one. Right.

Peter Costello:

So that's the wrong one. I also assure you on the one I pulled up was the one on the governance page on the website. So the public version is the October, 2023.

Sherburne Abbott:

Okay. Okay. I thought it was a senior moment on my part, but Okay, good, good.

Peter Costello:

It does explain your question though, and apologies for that.

Sherburne Abbott:

Okay. Okay, thanks. So I have one question, and not to be answered today, but this goes back to one of your first slides on meeting the market transformation, sort of the theory of market transformation. So if you look at that slide, it's unidirectional. So it reminds me of the old days when we talked about the loading dock model of r and d, right? One of the things that it doesn't show is the full range of our conversation over the course of the last half hour or so, which is how do the relative feedbacks and metrics and quantitative and qualitative feedback to this whole notion of pushing this transformation forward. Because especially when I look at the r and d, so if you look at the role of r and d in this slide, it's fairly significant, but it's not the place where I accept an unusual circumstances, and I suppose Doreen mentioned the iron oxide and some other investments that we make. There's no feedback to show what we're learning along the way is actually transforming those earlier stages of innovation. You see what I mean? No, not clear. Lemme see if I can

John Williams:

Clear Shere, and I think we're going to try and pull up that slide. Slide 12.

Unknown Speaker:

It's slide 12, right?

John Williams:

Yeah, yeah. Which

Sherburne Abbott:

Slide 12. I would love to see, this gets back at all of these conversations we've had about programmatic and metrics and how things lead you to an understanding of how we measure success. So if there's nothing in this timeline that shows that we're actually paying attention to things that work or don't along the way and how they feed back into a theory of change, that then translates into now we're pushing and transformed the market in a new and different way. Unless that is shown somehow it looks as if everything that we're doing is sort of leading in a single direction, and it doesn't, I mean, there are all these feedback loops that we've been talking about and checks and balances and programs and qualitative and quantitative metrics and all that. So it would be nice to see some way of incorporating these ideas about checks and balances, feedbacks and metrics into this visual

John Williams:

Shere. That's a, and

Sherburne Abbott:

The second part of that is, is that somewhere, and it's not going to be just dunsy, is how do we measure success?

Jay Koh:

I might chair, I think your comment makes a ton of sense. The two other pieces I would add to this is unfortunately because of the effect of climate change, this future that we're transforming the market into is never going to be static ever again. That's

Sherburne Abbott:

What I mean. And I guess what I'm getting at is that unless we show some ability to incorporate change in our theory of change, we don't look like we're paying attention to the climate dynamics.

Jay Koh:

So I agree with that. I would describe it probably inaccurately as a first and second derivative problem, like everything's going to change and the rate of which it's changing may also change. But the second point here is I also think that there are pieces of the trajectory that unfortunately if we're not careful can go backwards. I would hate for us to electrify public housing and then to find out that that is not done in a way that makes that public housing energy access more resilient. In fact, it makes it more vulnerable, right? If we have more fires and power outages because of electrification that cause people to get overheated or over cooled in extreme temperature situations, that ends up with human lives being affected much worse than the current energy mix that we have right now, which we know has different ranges of performance under different extreme weather event scenarios than we will be doing a massive disservice to those people and to the transition and the credibility of the transition we're trying to undertake here.

So I think capturing the fact that it's a dynamic environment and incorporating this idea of feedback, but doing it not just conceptually, but really like if we have a heat event in the state of New York and all the air conditioners, the supplied by renewable energy go out at the same time, it will be really tragic. And if there's an over cooling event in the wintertime, and if we had natural gas as opposed to electricity and more people would stay warm and not die, and we haven't incorporated that into the design of our electrification strategy, that will also be a tragedy. Both of those are extremely foreseeable sets of conditions, and we're the agency that's supposed to be the expert about those sets of conditions. So I would really like it to be incorporated into the forecaster because the set of conditions will now continue to change forever, at least through 2100 if you read any of the science that we afford to be experts around. And so incorporating that into the way we're deploying billions of dollars of funding, I think would be helpful.

Sherburne Abbott:

Better said. Okay. So one other point, I think for the future, which is looking at this r and d set, I think one of the things that we really need to think about in the future is sort of, Anthony, we've talked about this is the role of AI and data analytics and how it really can change the game. It's a future conversation, but it touches on every single program and has great utility and also challenges, but it would be something that would be a good future discussion noted. Any other comments? Sorry, I've lost my face Id

Charles Bell:

Shere?

Sherburne Abbott:

Yeah.

Charles Bell:

Yeah, I had two questions. One was just when we were looking at the energy storage slide, and I was thinking of the end date of 2030. It looks like a steeper climb than some of the other programs where we've had more success as to solar. And so it made me wonder, are we going to be able to catch up to get the progress, to get the goal on energy storage? Maybe there will be disruptive innovation. I'm not sure, but it did seem like it was a ambitious goal with only five or six years to go, are we going to be able to achieve?

David Sandbank:

Yeah, it is an ambitious goal with a short period to go. Some of the challenges there were quite honestly, just didn't get as much federal support as solar did, and it's not as much as an advanced technology as solar is or was. So we think that with the roadmap adoption of six gigawatts by 2030, it's really going to help to accelerate that dramatically as well as the 30% tax credit for energy storage provided by the Inflation Reduction Act is going to really help out a lot. And you're looking at a lot of the major forecasters like Bloomberg, and you have wood McKinsey that are really now bullish on storage for us. And so those tailwinds we think are really going to help our cause get there. Without the adoption of the roadmap, it would've been a real struggle to just reach the three gigawatts by 2025.

Charles Bell:

Okay, great. You, the only question for Susanne about just the dissemination of the findings from excellence, does that go to a statewide audience? Like the people in upstate cities, for example, benefits from the insights of multifamily building? Just wondering how that

Susanne DesRoches:

Yeah. So these projects are statewide and many of the multifamily buildings that are in buildings of excellence are upstate. Just wanted to make sure that was clear. One of the things that we, and to your point about AI that we are looking to do across the buildings portfolio in general is how are we presenting this data and how can we start, now that we have a body of projects, how do we start presenting it from the lens of the key findings rather than just all of the data? So that's a project that we have sort of started with our flex tech program and with buildings of excellence, what are we doing to make that data even more accessible?

Charles Bell:

Super. Thank you.

Sherburne Abbott:

Good. Anything else? Oh, this is excellent. Thank you so much, all of you, Jen, Suzanne, everybody. It was really, really a really useful discussion and I hope we can continue to ponder on some of this stuff in the Board meeting as well. No formal action is required for this item. The last item on the agenda is other business. Is there any other business before the Committee? None. Can I have a motion to adjourn?

Jay Koh:

Moved.

Richard Kauffman:
Second.

Sherburne Abbott:
All in favor?

Members of the Committee:
Aye. Aye.

Sherburne Abbott:
Opposed? The meeting is adjourned. Thank you so much.