**Energy Efficiency and Housing Advisory Panel**
**Meeting 1**
**September 16, 2020**

**Attendees**

- Commissioner RuthAnne Visnauskas, NYS Homes and Community Renewal (Chair)
- Janet Joseph, NYS Energy Research and Development Authority
- Peggie Neville, NYS Department of Public Service
- Gina Bocra, Chief Sustainability Officer, New York City Department of Buildings
- Amy Sugimori, Director of Policy and Legislation at 32BJ SEIU
- Dan Egan, Senior Vice President of Energy & Sustainability at Vornado Realty Trust
- Bret Garwood, Chief Executive Officer at Home Leasing, LLC
- Jin Jin Huang, Executive Director at Safari Energy, LLC
- Clarke Gocker, Director of Policy and Strategy at PUSH Buffalo
- Jamal Lewis, Senior Policy & Technical Assistance Specialist at Green & Healthy Homes Initiative
- Sadie McKeown, Executive Vice President, Chief Operating Officer at The Community Preservation Corporation
- Bill Nowak, Executive Director of New York Geothermal Energy Organization
- Molly (Dee) Ramasamy, Head of Deep Carbon Reduction at Jaros, Baum & Bolles
- Daphany Sanchez, Executive Director at Kinetic Communities Consulting
- Laura Vulaj, Senior Vice President & Director of Sustainability at SL Green Realty Corp.

**Not in Attendance**

- Kyle Bragg, President at 32BJ SEIU (represented by Amy Sugimori)
- Elizabeth Jacobs, Acting Executive Director of the Akwesasne Housing Authority

**Welcome and Objectives** [see slides 3-4]
Welcome to the Energy Efficiency and Housing Advisory Panel. A quick run-down of our agenda:

- We will go for about 2 hours. We have a robust decarbonization pathways presentation, we'll talk about the current state of the sector, and then discuss what our work trajectory looks like. We hope to have a robust discussion with a lot of input from all of you. Before we get to our introductions, a reminder that the Climate Leadership and Community Protection Act (CLCPA) mandates an 85% emissions reduction by 2050 aiming to get to 100% zero carbon electricity by 2040 and the first statutory Climate Action Council (CAC) which is working to develop a scoping plan.
- The Energy Efficiency and Housing Panel specifically will develop recommendations for the buildings sector for reducing emissions and will put them up for the CAC's consideration.
- Today we'll talk about the expectations for this group, the scope of this work, and how we'll approach this.

(*Commissioner Visnauskas*)

**Introductions and Panel Member Priorities** [see slide 6]

- *Commissioner Visnauskas*: All of the Panel Members here bring different expertise. I invite you to share an introduction about yourself and the priorities for you or your entity that you're hoping to see become part of this conversation the panel will be having.

- *Janet Joseph, NYS Energy Research and Development Authority*
    - Primary focus of my work here is on building decarbonization. I have been working on climate and clean energy for the better part of 3 decades, it is exciting to see this work in place and the leadership NYS is bringing forward on this absolutely pressing topic. The buildings sector is a tough sector to make progress on. It's where people live and work; the policies we put forward really need to play out and make sense to the everyday decisions that New Yorkers make. We have our work cut out but the time is right and the path forward is absolutely critical.
- *Peggie Neville, NYS Department of Public Service*
    - Deputy Director for Efficiency and Innovation
    - I echo many of Janet's sentiments in just how difficult the built environment is and the massive changes needed to achieve our goal. I'm very interested in learning from all of you. I've been with DPS for 6 years, prior to this at NYSERDA. I have a more regulatory role now but, in my career, have also been involved with administering programs and working with building owners. My current role is, among other things, to oversee utility electric and gas programs as well as NYSERDA's state building electrification programs. I'm very proud of the work New York has done to date in achieving energy efficiency but the level of scale up is extreme from a big picture perspective and I do firmly believe the programs operating need to evolve to rise to that challenge. I'm interested in how we can set up the right environment for them to succeed.
- *Gina Bocra, Chief Sustainability Officer, New York City Department of Buildings*
    - Architect and sustainability expert within the NYC Department of Buildings
    - I hope that I can bring collaboration from efforts on Local Law 97 and the work with our advisory board to the Climate Action Council and make sure that we're in step with each other.
- *Amy Sugimori, Director of Policy and Legislation at 32BJ SEIU (delegate for Kyle Bragg)*
    - I am very pleased to be here on behalf of Kyle Bragg. 32BJ SEIU represents over 175 thousand building service workers up and down the East Coast, with more than half working and living in New York State. Our members provide building services in both commercial and residential sectors as well as at various transportation locations. We had advocated together with NY Renews for the CLCPA so we're very excited to be part of its implementation.
    - Particular interest in green janitors programs and are very interested overall in role workers play in this transition.
    - We see ourselves and our members as stakeholders who both care about the environment and people who work in buildings
- *Dan Egan, Senior Vice President of Energy & Sustainability at Vornado Realty Trust*
    - I run sustainability and utilities at Vornado Realty Trust
    - *At* Vornado, we have made the commitment to making buildings carbon neutral by 2030, which aligns with goals of CLCPA. This work comes with a very long and winding path with lots of challenges endemic to the built environment and urban centers.
    - I'm looking forward to learning and sharing with this group to make recommendations that are implementable across the industry.
- *Bret Garwood, Chief Executive Officer at Home Leasing, LLC*
    - Home Leasing specializes in affordable housing and we are very active everywhere in New York outside New York City. As a certified B corporation we hold ourselves to high standards with regard to energy and the environment and work hard to continually develop increasingly energy efficient projects, including net zero and solar farm.
    - Also a city planner and very active in community planning. We often exist in contexts where the surrounding community is energy distressed so very interested in what we'll do in places that aren't traditionally touched by public resources.

- *Jin Jin Huang, Executive Director at Safari Energy, LLC*
    - I've been involved in buildings and energy efficiency since 2002. I've worked in HVAC consulting for 10 years, designing buildings, and working with utilities. I worked with staff from NYSERDA while at Con Edison.
    - Now working in renewable energy and developing solar for commercial customers.
    - Been involved with ASHRAE since 2011 at the local level and the national level. At ASHRAE, we've been focused on holistic approaches to energy. Feel that for too long the design communities have been siloed.
    - Energy efficiency is in a nexus where we need to think about everything from end user habits to on site renewables.
- *Clarke Gocker, Director of Policy and Strategy at PUSH Buffalo*
    - PUSH is a 15-year old community-based organization working at the intersection of green jobs and affordable housing.
    - For past 10 years we've been a contractor for NYSERDA programs.
    - I hope to contribute around issues of affordability and accessibility, reinvestment into disadvantaged communities.
    - PUSH has been an active member of the coalition to bring CLCPA to the finish line.
- *Elizabeth Jacobs, Acting Executive Director of the Akwesasne Housing Authority*
- *Jamal Lewis, Senior Policy & Technical Assistance Specialist at Green & Healthy Homes Initiative*
    - GHHI is a nonprofit dedicated to health, energy efficiency, and affordable housing through the alignment of healthy housing and energy efficiency programs.
    - Also a member of the NY Energy Efficiency for All coalition, which has a focus on improving access to energy efficiency programs among affordable multifamily housing residents.
    - I want to call attention to the importance of making sure we are working to advance healthy, safe, and affordable housing. In doing that we know health and safety issues present a tremendous barrier to accessing energy efficiency.
- *Sadie McKeown, Executive Vice President, Chief Operating Officer at The Community Preservation Corporation*
    - The Community Preservation Corporation is a construction lender [for affordable multifamily housing].
    - Started sustainability initiative in 2008 with intent of integrating energy efficiency measures and high-performance measures into loans.
    - Not easy or simple because other banks do not require it.
    - We've done a lot to educate property owners on how to make buildings more efficient, including on passive house applications in affordable housing.
    - Interested in trying to use finance to make the changes needed in buildings.
    - Can change the built environment through code which is being addressed, and through requirements, but unless you create more demand by having the capital required you don't have the scale we need in this country to drive the cost down. It's almost unfair to burden affordable housing with the costs until we bring down the costs.
    - Interested in this panel because it is a representation of more than just affordable housing people.
- *Bill Nowak, Executive Director of New York Geothermal Energy Organization*
    - I believe an important thing to look at is codes.
    - One of the things [ground source heat pumps] bring to the table is the ability to get through this transformation without creating a big peak in winter or summer peak demand

- *Molly (Dee) Ramasamy, Head of Deep Carbon Reduction at Jaros, Baum & Bolles*
    - We are consulting engineers for NYC and surrounding areas with over 100 years of experience, actively involved in NYC market and others around country.
    - Thought leaders in building design as it relates to energy efficiency, energy reduction.
    - Regarding the policy landscape, we have developed a new service focused on addressing building electrification and decarbonization barriers.
    - First part of my career was spent in operations, so I'm hoping to bring insight about feasibility and impacts that people working in the buildings might feel.
- *Daphany Sanchez, Executive Director at Kinetic Communities Consulting*
    - Pronouns: She/ella.
    - I'm a public housing resident and descendant of 3 generations of public housing residents, so affordable housing is not only where I work but where I sleep, wake up and experience life.
    - I've been working in energy efficiency and housing for 12 years. Important that work done is focused on efficiency and affordability ensuring that there is a just transition off fossil fuels and that it does not accelerate gentrification.
    - Proud participate of NY Renews.
    - Excited to elevate local communities and streamline energy efficiency in affordable housing in a way that does not accelerate gentrification.
- *Laura Vulaj, Senior Vice President & Director of Sustainability at SL Green Realty Corp.*
    - Oversee ESG, sustainability, and special programs.
    - Energy efficiency has been a big part of operations for the past decade. 5 to 10-year capital plans that address topics like peak demand, LED lighting projects, chiller projects.
    - I'm excited to look at all elements of the building, see how spaces are being used, what the density is, what challenges will happen when we implement these improvements.

We have a tremendous group here that brings many perspectives and expertises. I'm really excited to jump in.

We are not alone, we have a big group of folks from the state agencies that will be here to support the effort. To get to these recommendations we will have staff who can support research and putting the materials together to be a support group for this Advisory Panel. (*Commissioner Visnauskas)* [see slide 7]

We have a great presentation from Tory Clark from E3, a consultant that is assisting the State. Soak up as much as you can, it is dense, but we will be sharing after. One thing to note before jumping in is afterwards we will have Q&A and then we will whiteboard some topics that people want to raise and talk about some of the recommendations in 3 buckets: energy efficiency and conservation, low carbon fuels, and decarbonizing the electricity supply. If we feel that is not the right approach we can shift, but it is a place to start. (*Commissioner Visnauskas)*

**Decarbonization Pathways Presentation** [see slides 9-26]

- *Tory Clark, Director at E3 working on economy-wide picture of deep decarbonization for New York State*
- Background on the work:
    - Presented work at CAC meeting in June, which includes findings both from literature review and analysis. More information has been posted to the Meetings and Materials page of climate.ny.gov.
    - Important to note that we started this work before the passage of the CLCPA. In doing this, trying to set up illustrative pathways that set a course for ambition. It is not meant to be a forecasting of the future but to level set on the effort needed to achieve the goals.

  - Developed scenarios in an economy wide modeling framework looking at buildings, electricity, and transportation.
  - Today we'll dive into key findings for buildings and housing efficiency with time at the end for questions and answers. The presentation will focus on characterization of buildings, opportunities for decarbonization, and key findings.
- *Sharad, E3:*
  - Buildings emissions have dropped 25% since 1990. Ongoing work is to update this accounting to be consistent with CLCPA and as we do this we'll be updating the buildings emissions, but this is still informative.
  - The way we have done our accounting, we've allocated emissions from the electricity used in buildings to the electricity sector, so these emissions are tracked in the analysis but not allocated to buildings. The buildings emissions shown here are direct emissions from on-site fuel combustion in buildings.
  - Pie chart shows that buildings accounts for a little over a quarter of emissions with a little over half coming from residential, little under half from commercial.
  - Vast majority of fossil fuel use in buildings is space heating and water.
  - Fuels breakdown shows majority of fuel emissions are from natural gas.
  - Forecasting includes population expected growth, commercial expected growth (based on population growth), and anticipated changes in energy intensity of residential and commercial space (based on appliance codes, building codes, etc.) 65% of direct emissions are from space heating.
    - Electric heating is better for carbon, but potentially stresses the electricity grid.
  - Based on these key drivers for forecasting emissions we constructed two scenarios from which to reduce emissions.
    - Baseline scenario: emissions are flat over 30 years.
    - Reference scenario is the core scenario, layers on state policy pre-CLCPA including New Efficiency: New York and Local Law 97 through 2030. See significant reduction in buildings emissions here.
  - What are the options more generally for decarbonization? Three pillars based on literature review and analysis.
  - No single pathway to achieving deep decarbonization in buildings, there is some optionality between different pathways.
    - What does decarbonization policy look like? Increased adoption of efficient appliances
    - And electrifying space and water heating, which also adds challenges

**Tory:**

- "High technology availability" pathway
  - This shows a big shift towards end-use electrification
  - 50-70% of new heating sales would need to feature low carbon technology in heating
    - Would lead to a new "peak" for electricity generation during the winter, though the exact magnitude will vary based on the type of technologies adopted, particularly in space heating.
    - This scenario assumes a balanced mix between air source and ground source heat pumps and also some amount of flexibility in building end load to mitigate impact on the grid.
    - This is a key intersection with the Power Generation Advisory Panel.
  - Ability to shift to better space heating technology will depend on the lifecycle of new technology turnover (if people don't replace, then it won't matter what's out there)

- We are modeling electricity consumption over time, but again the electricity-related emissions are tracked in another sector. Focus here is on direct emissions from on-site fuel combustion
- Timing of new infrastructure:
    - One of the things we do is think about timing of new investment in technologies.
    - At least 50% of new heating system sales being a heat pump in 2030, which is a pretty significant transformation from today.
    - You can see a lag in what technologies are continuing to operate that are purchased today. The bottom image shows reducing total fossil consumption over time, with electricity taking over half of residential space heating energy use by 2050.
- Overall, calling out the important role of buildings in the economy-wide picture of decarbonization.
- Low carbon fuels: role of advanced low carbon liquid and gaseous fuels. In buildings, this includes a role for renewable natural gas, potential hydrogen for backup heat, and potential for renewable distillate in buildings.
- Next steps for E3:
    - Adding CLCPA GHG accounting framework to align with CLCPA requirement to include upstream emissions and 20-year Global Warming Potential of all GHG.
    - Review of performance and cost assumptions with this panel.

**Decarbonization Pathways Q&A**

- Is the data behind these graphs is on materials page of the website? Are there excel spreadsheets? (*Bill Nowak*)
    - *On the CAC website there are materials from the June meeting including the report and appendices; not spreadsheets, but Panel can reach out to E3 for more information.*
- Do you have a sense on when CLCPA methane accounting will start showing up in data? (*Bill Nowak)*
    - *Not a specified timeline yet but it's in progress.*
- There was a slide where electrification was shown as cold climate air source heat pumps. As a statement, it would be more clear if you could include reference to ground source heat pumps also, so folks realize there will need to be a balance between those technologies to manage winter peak. Can you restate what that balance is between heat pumps in the scenarios? (*Bill Nowak*)
    - *We do have a mix between heat pumps. Ground source heat pumps are about 1/3 of the mix. There is more information in the report, and we can engage with the panel in terms of how to think about that*
- On the two pathways can you give a description of what those pathways really entail? (*Molly*)
    - *In the spectrum of buildings, the key difference is in timing and level of effort.*
- Would it make sense for us to have a follow up with a small set to get into this presentation to discuss the inputs, understand the models and what went into it? Curious why you didn't include solar and storage in alternative fuel analysis? (*Jin Jin*)
    - *We do include distributed resources and utility and battery storage in the electricity generation portion of the model so those are not shown here. Happy to tease out those findings for this group as it is of interest. We are planning to review data, assumptions, and modeling with the advisory panels down the road for those that want to.*
- When you learn the new CLCPA accounting I imagine this group will want to understand how they differ from each other and how to evaluate going forward. (*Dan*)
- When you show building emissions by subsector, interested in the portion of different types of residential. What is different between small multifamily and large multifamily? (*Bret*)
    - *We do have a large downstate building type meant to reflect NYC and a smaller multifamily building type that's much smaller. Good point to flag that we're hoping to be able to-- with the*

*input of this panel-- refine our analysis as well as intake information from other simultaneous analyses taking place.*

- There is tremendous variation in building conditions that impacts emissions reduction potential. Did you take this into account in your analysis? I understand that you are forecasting for the next 30 years. (*Jamal*)
    - *The key variation that we're trying to capture is variation in weather across the state Demand for space heating is key emitter so trying to capture differences in state climate zone. Did not really reflect which type of building will be good for which type of technologies but instead what the mix is. But welcome input about whether the assumptions are realistic*
- Does your model just assume everyone can afford to do this? I think economics are very challenged for some buildings to make any changes (*Sadie*)
    - *We're not making any assumptions about difference in LMI housing versus the broader sweep of housing. This work captures what is the level of effort needed.*
    - *Costing is one of the next topics of engagement and Advisory Panels will be involved.*
- This is a great report and a great start for us to have this conversation. This report essentially reflects if money is not an issue, what can we do, right? Is there plan to start incorporating another study where we incorporate behavior and maintenance impacts? When we start having raises in rent and electricity people walk away. I'm throwing this out as a question to the Commissioner and NYSERDA about what we are doing for looking to that portion of the picture? (*Jin Jin*)
    - *That is within the scope of our work going forward. We have to look at the equipment, the operations, controls. As a group when we talk about approach and work plan, it's all on the table. If this collective group feels that is important and significant then we need to further map out the work and analysis, but I certainly agree that is needed. (Janet)*
    - *Yes, in general we want to have a "please put it on the table" approach, and we may later have to realize we can't get to everything and we'll deal with that when we get to it. (Commissioner Visnauskas)*
- John Ciovacco from the NY-GEO board has a good presentation on refrigerants and Jerry Acton put together rate case testimony on similar work from different angles in a way that is really understandable. At some point it could be helpful to share these presentations. (*Bill*)
- For Janet, I think understanding historically where emissions reductions drivers are coming from would help with recommendations. (*Clarke*)

**State of the Sector in Brief** [see slides 28-34]

- *Vanessa Ulmer, NYSERDA*
    - Senior Advisor with NYSERDA's Energy and Environmental Analysis group. Co-presenting this with Simon McDonnell of Homes and Community Renewal.
    - Co-leads of staff working group and will provide research and analytic support as well as making sure panel has a robust mechanism for reaching out to and intaking public comments.
    - We've received some questions about whether we are taking questions and comments from the public during today's webinar. We aren't able to do that today, but going forward we will have opportunities for public engagement.
    - Presenting today a brief overview of New York's commitments to energy efficiency as well as highlights about the residential building stock.
    - Panelists, if there is other info that will help you do this work let Simon or I know.
    - Energy efficiency is a cornerstone of New York States' national leadership. We have a medium-term target for energy efficiency codified in CLCPA as well as the very important commitment to carbon free electricity by 2040, which is critical to building electrification.

- With respect to the State's 2025 energy efficiency target, a goal was set in 2018 to reduce site energy use by 185 trillion Btu (TBtu) below the 2025 forecast.
- This spans across all fuel sources as well as residential, commercial, and industrial buildings.
- The 2025 efficiency target was announced coupled with a portfolio of strategies on Earth Day of 2018, so interagency partners have been advancing these actions with other industry stakeholders, market actors, and local governments.
- As others have alluded to, it's important to use public resources to enable the markets. One major tool we have is a very robust commitment to our state's energy efficiency programs and ensuring the best coordination we can across utility energy efficiency programs, NYSERDA energy efficiency investments, and financing that is available through NYPA and also enabled by the NY Green Bank.
- Two examples of this coordination include NYS Clean Heat and the statewide LMI portfolio.
- Also committed to a skilled workforce, making upgrades to our state buildings, and advancing building energy codes and appliance standards.
- While we do have a robust starting point, CLCPA has raised the bar in terms of where we need to go. We need a step change in the level of ambition.

- *Simon McDonnell, Director, Office of Research and Strategic Analysis at HCR:*
  - Providing very brief overview of housing stock in New York.
  - 19 million New Yorkers live in 7.3 million homes.
    - 11 million in 3.9 million owner-occupied homes (3/4 are single family, 9% 2-4 unit).
    - 8.3 million in 3.4 million renter-occupied homes (2.1 million in NYC, 60% statewide are in 5+ unit bldgs., 50% in 10+).
  - Stock is relatively old.
    - 40 thousand homes built every year (mostly multifamily).
    - 92% is over 40 years old, 1/3 are pre-war.
    - 85% are heated by fossil fuels (60% utility gas, 20% fuel oil).
    - 12% are electric heated but they're generally inefficient furnaces.
  - We are going to be doing a much deeper dive into the housing stock and into the commercial stock at a later meeting.

Thank you and to echo what Simon says, as folks on the Advisory Panel want additional information or have other thoughts, we are happy to come back as you think of things. We're happy to provide these deep dives here and there. (*Commissioner Visnauskas*)

**Scope Development Discussion,** *presented by Janet Joseph* [see slides 36-37]

- So what are we being asked to do? That's what I'm going to cover here.
- We heard the level of reductions we need to achieve. We view that work as essentially looking at those three pillars that the Pathways team identified as the broad solution set for what we need to delve into. That is all within the scope of this group. This group may identify other things, and we definitely want to hear your thoughts. As we have looked at this issue, we see the solutions being energy efficiency and conservation, low carbon fuels with emphasis on building electrification, and certainly decarbonizing the electricity that's coming into the buildings. There is another Advisory Panel looking at ways to decarbonize the grid, but we will be looking at on-site issues related to renewables and building flexibility with the grid.
- The task to the group is defined in a handbook that the staff team have pulled together, the Advisory Panel handbook, that we will share.
- We are looking at new and existing buildings, but the bulk of the work to do is with existing.

- We are looking at all buildings, I want to underscore this. But we have a keen focus in ensuring we have affordable housing across New York State.
- We are being asked to identify policies and strategies that can reduce emissions and we are being asked to consider impacts to the people who own the buildings, who operate them, the tenants who rent. And we are being asked to identify for each strategy the impacts on affordability and disadvantaged communities; that is a key interest under the CLCPA.
- We are being asked to look at ways for improving the economics of these solutions. Some of these today would be deemed not cost effective so we're looking for ideas on how to improve the cost competitiveness.
- We are being asked to identify labor issues and workforce impacts: both positive and identifying where there are labor shortages.
- We are being asked to size the impact. So if this group is looking to advance a particular policy, we are being asked to indicate what the number of buildings is, the greenhouse gas reductions, and if there are other public health benefits and if there are economic benefits. On this point we expect that we will need analytical help in doing this quantification and we can talk about how to do this, but we will be bringing consultants to the table.
- Another important point about what we are being asked to do is about how will the policy work in the real world? How viable? How practical? We have a great group of panelists to think through this practical component of the work.
- There are several other advisory panels whose work could have a nexus with the Energy Efficiency and Housing Panel: Power Generation, Land Use and Local Government (codes), Agriculture and Forestry (bioenergy supplies), the Just Transition Working Group (labor dislocations or opportunities associated with climate policies).
- This is a view of what the CAC is asking us to tee up with a set of recommendations. It is a robust scope but we all fundamentally agree we need to look at these if we're going to advance recommendations to move forward in New York State.

We have a blank slide and we want to input from folks through a type of whiteboarding exercise. (*Commissioner Visnauskas*)

**Whiteboard Exercise**

- Prioritize energy efficiency with affordable housing first. Opportunity of streamlining whatever financing mechanisms or programming that comes out of the recommendations. (*Daphany*)
- This is definitely a high cost. Try to quantify the dollar cost of what this will take, mandate it so it gets done, and then look at who can absorb that costs. Affordable housing and multifamily, they can't afford this. We also need to look at where can we look at capital separate and apart from the resources that exist, including innovation. My mind always goes to cost because that's the wall I always hit. (*Sadie*)
- Based on the cost point, we really need to think about [maintenance] deferrals which are a real problem for energy efficiency, for things like weatherization. As we're brainstorming about ways to bring capital, we also need to consider how can we incentivize the addressing of health and safety that lead to many [maintenance] deferrals across the portfolio (*Jamal*)
- Cost is a big issue but it goes beyond. When I did some work with NYCHA, the buildings are adversely incentivized to be more efficient. If you're a building operator and you manage your system better, whatever meager savings that you get doesn't come back to your building to further advance, but goes to a general pool. Costs are so broad; we need to make things more bite sized and look at what does it incentivize. (*Jin Jin*)

- We have such a wide representation of experience here. Let's look at: what walls are we continually hitting, what are the repeating obstacles? I would love to hear this more in the time between our meetings. Start looking at these obstacles and put them in buckets. Facades of buildings present a huge issue because they're leaking but it's not cost effective to address. (*Jin Jin*)
- Look at existing local law infrastructure. Maybe we amend Local Law 11 to include plugging the leaky holes in buildings to drive up the efficiency through another mechanism. Look at what we're already doing and leverage that so you don't hit the resistance of more regulation. Building decision makers only want to do what is required. (*Sadie*)
- When affordable housing is looking at gut rehab, think about when they are already replacing. The existing methodologies still look at like for like replacement but we should look at upgrades. (*Daphany*)
- What can we physically do? There are spatial constraints in some of these technologies. Understand these challenges and the trajectory of these existing technologies to become less expensive, more efficient, and literally smaller so we can deploy it in a way that makes sense. (*Molly*)
- Change perspectives on what cost effective means. The payback periods for some of these means you just can't do in a payback of 5 years or less, so we need to work on changing mindsets on what is acceptable. (*Molly*)
- Market signals such as certainty on what the carbon intensity of the grid will be in the future and utility pricing indicators for the future. Also how incentives from NYSERDA and Con Ed are issued to underwrite. Right now there are strictly electricity measures or gas measures but I think we need to think about how carbon measures can be drivers. I think we need to think broadly about how all of those different market signals contribute to the success for implementing all these activities. (*Dan*)
- Voluntary demand-based delivery rates for electricity. Putting this into practice would be a game changer for operating costs of geothermal heat pumps. (*Bill*)
- For geothermal heat pumps, access to the right of ways will be important in big cities. There's very little space to access the ground and dealing with legal constraints will be very helpful to move forward. Also explore third party ownership: much of the issue is upfront cost. (*Bill*)
- Address "hidden" subsidies for other heating sources (e.g., 100 feet of pipe provided free for gas hook ups). (*Bill*)
- Could we change the name of the buckets? I don't think of electricity as a fuel. And I don't think the low carbon fuels will play a very big role going forward in buildings; I think that would be focused on industrial. I'd call it "Electrification and low carbon fuels" (*Bill*)
- Research from CA shows third party ownership increases the burden on affordable housing and communities of color. We need to think about models that lead to ownership for these communities to actually own the equipment. Streamlining dollars. (*Daphany*)
- Think about distressed communities in the 1970s, how did we transform the built environment? We did it through robust municipal programs in low income communities through tax incentives. A lot of affordable housing already has 0 taxes but it could be something that is available to other building owners of all types, that there be a short term tax reduction to create a capital availability stream to pay the debt service for upfront capital costs. Taxation and financing as mechanisms. (*Sadie*)
- I think to Tory's slide on single family homes which we haven't talked much about. We should make sure we have them included here. I don't know if the air source and ground source heat pumps are the same solution for single family, but I want to make sure we make some space for how are we getting that subsector. (*Commissioner Visnauskas*)
- We've talked a lot about technologies and the scale that we need to approach. A lot of times the programs we've had in place address various pieces of equipment, there is a huge space in how we better scale programs to address shell measures. No one has figured out how we do that to scale yet and it might be a different approach than equipment measures. (*Peggie*)

- I'm curious to know how much consumption in single family homes is being driven by inefficiency and poor condition versus owners that just don't care about their usage but the building is in great condition. Interested in consumption in different circumstances. (*Bret*)
- In commercial for obstacles, how do we address tenant composition, density, and how these buildings are used to understand these buildings? (*Laura*)
- How do we incentivize development? Evaluate the cost benefit and how we can frame the health benefits. When you always go to the lowest bidder your pool is very limited and you end up with less experienced, smaller bidders. Look to CA energy storage as an example. To energize the market, we'll have to consider this kind of cost effectiveness. (*Jin Jin*)
- Personal desire to shift the language from cost effective to equity effective. In terms of health benefits, when we look at big reasons for [maintenance] deferral, health and safety is a big barrier. Think about mold, etc. that are detrimental to the occupants' health. NYC passed legislation which makes sure there is no mold, moisture, or mildew. Policies like that and existing housing code in the energy efficiency standard and other health and safety codes can be helpful if enforced right. (*Jamal*)
- We've looked at a number of different mechanisms for capital to address health and safety, including working with Medicaid to potentially fund the health and safety measures that improve occupant health and reduce asthma. (*Jamal*)
- Also look at hospitals and other anchor institutions that we know have a disproportionately been extractive of the communities they're in. Think of how to leverage those resources to get us to the point where buildings are electrification, energy efficiency, and weatherization ready. (*Jamal*)
- Local Law 97 mandates energy audits. Is there opportunity to address operations and maintenance gaps and make sure we don't miss opportunities here? (*Gina*)

**Work Plan and Next Steps**

- *Emily Dean, Director of Market Development, NYSERDA*
- Timeline:
    - The work of this panel is really heavily concentrated in 2020 and early 2021 driving towards a deadline of providing recommendations in March 2021.
    - Near term milestones in 2020:
        - In October this panel will brief CAC on scope and workplan so this is the focus in weeks ahead.
        - Advisory Panel will also seek external input and indicate opportunities for public engagement. In November, shift to discussing high potential strategies, benefits, and impacts.
    - December, first draft of recommendations.
    - Will meet twice in September and monthly thereafter.
    - We will have an exciting and busy couple months ahead.
- Next Steps (*Commissioner Visnauskas*):
    - Another meeting on September 30 (invite went out today) then monthly meetings.
    - Sending out draft of this workplan to the Advisory Panel Members by the 23rd.
    - To the extent that there are subinterests, we're happy to create subgroups. Shoot a note to Commissioner Visnauskas, Janet, or the staff working group if you have ideas and we can talk more about what makes sense. Generally happy to receive input.
    - Please be in touch, we want to be very accessible and we have a great team. We'll circle back with you on the best ways to get in touch.
    - Thank you all, we had some great conversation.