

MINUTES OF THE CLIMATE ACTION COUNCIL MEETING
HELD ON OCTOBER 14, 2021

Pursuant to Notice and Agenda, a copy of which is annexed hereto, a meeting of the Climate Action Council (“Council”) was convened at 1:00 p.m. on Thursday, October 14, 2021.

The following Members attended, and a quorum was present throughout the meeting:

Council Co-Chairs

- Doreen Harris, President and CEO, New York State Energy Research and Development Authority
- Basil Seggos, Commissioner, New York State Department of Environmental Conservation

Council Members

- Richard Ball, Commissioner, New York State Department of Agriculture and Markets
- Donna L. DeCarolis, President, National Fuel Gas Distribution Corporation
- Marie Therese Dominguez, Commissioner, New York State Department of Transportation (Ron Epstein, Designee)
- Gavin Donohue, President and CEO, Independent Power Producers of New York
- Dennis Elsenbeck, President, Viridi Parente, Inc.
- Thomas Falcone, CEO, Long Island Power Authority
- Vacant, Commissioner and President and CEO-designate of Empire State Development (Vince Ravaschiere, Designee)
- Rose Harvey, Senior Fellow for Parks and Open Space, Regional Plan Association
- Rory Christian, Chair and CEO, New York State Public Service Commission
- Dr. Bob Howarth, Professor, Ecology and Environmental Biology at Cornell University
- Peter Iwanowicz, Executive Director, Environmental Advocates of NY
- Gil C. Quiniones, President and Chief Executive Officer, New York Power Authority
- Roberta Reardon, Commissioner, New York State Department of Labor
- Anne Reynolds, Executive Director, Alliance for Clean Energy New York
- Rossana Rosado, Secretary of State, New York State Department of State (Kisha Santiago-Martinez, Designee)
- Raya Salter
- Dr. Paul Shepson, Dean, School of Marine and Atmospheric Sciences at Stony Brook University
- RuthAnne Visnauskas, Commissioner and CEO, New York State Homes and Community Renewal
- Howard A. Zucker, Commissioner, New York State Department of Health (Henry Spliethoff, Designee)

Also present were various State agency staff and members of the public. Mr. Seggos and Ms. Harris, Co-Chairs of the Council, welcomed all in attendance. Co-Chairs Harris and Seggos acknowledged the impending November 2021 departure New York Power Authority CEO Gil Quiniones while citing his many

substantial accomplishments. CEO Quiniones expressed his gratitude for the opportunity to serve New York State, Governor Hochul, and on the Council and introduced Justin Driscoll, General Counsel and Executive Vice President, as Interim President and CEO of the New York Power Authority.

Consideration of the Minutes of the October 1, 2021 Meeting

The next item on the Agenda was to advance the minutes from the October 1, 2021 Meeting. Upon addressing two editorial clarifications for additional clarity, and with no further changes or objections, and upon a motion duly made and seconded, the minutes were adopted.

Presentation and Discussion: Integration Analysis Scenario Results

Co-Chair Harris introduced Carl Mas, Director, Energy and Environmental Analysis, NYSERDA to present additional information regarding the Integration Analysis which included (1) an overview of scenarios and recap of sectoral results; (2) benefits and costs analysis; (3) electricity system sensitivities; (4) air quality and health effects; and (5) an update on the approach for potential carbon pricing analysis. Co-Chair Harris emphasized the statutory requirement of evaluating the costs and benefits of the recommended measures in the Scoping Plan, in addition to estimating emissions reductions. She also expressed her gratitude for the exhaustive body of work undertaken by the project team. In turn, Mr. Mas thanked CEO Quiniones for his support and collaboration, particularly with the recent Power Grid Study, for keeping the electric system running smoothly, and for his contributions to nation-leading work on a smart and clean electric grid.

Mr. Mas began by providing references to the Climate Act website resources page, which includes presentations, spreadsheets, workbooks, and links to studies and supplemental studies. He reviewed the scenario analysis, stating that in addition to the Reference Case and Scenario 1 that reflects the Advisory Panel recommendations, three additional scenarios will be presented that meet or exceed greenhouse gas emission limits and achieve carbon neutrality by mid-century. He noted the level of commonality across all of them from a zero-emission power sector by 2040, to the enhancement of transit, more rapid and widespread electrification and energy efficiency, higher methane mitigation, and an increase in end-use electric load flexibility. Scenario 2 reflects the strategic use of low-carbon fuels, Scenario 3 reflects an accelerated transition away from combustion; and Scenario 4 accelerates electrification and limits low-carbon fuels, includes additional vehicle miles traveled reductions, accounts for additional innovation in methane abatement and avoids direct air capture of carbon dioxide to go beyond an 85 percent reduction in emissions by 2050. The focus of this meeting was on Scenarios 2 and 3. Scenario 2 includes the use of bioenergy derived from biogenic waste, agriculture and forest residues and limited purpose grown

biomass, as well as green hydrogen. Scenario 3 includes low-to-no bioenergy and hydrogen combustion and accelerates electrification of buildings and transportation.

Mr. Mas displayed the level of transformation in Scenarios 2 and 3 in terms of efficiency and electrification, transit and smart growth, zero-emission vehicles, clean electricity, low-carbon fuels, emissions mitigation in agriculture and waste, carbon sequestration in lands and forests, and negative emissions technologies. Mr. Mas described, in detail, the level of transformation in Scenario 2 and Scenario 3 for the buildings and the transportation sectors, along with estimates of stock roll-over and anticipated adoption of key technologies.

In response to an inquiry by Dr. Howarth regarding the emphasis on air source rather than ground source heat pumps and whether ground source heat pumps may ultimately reduce peak winter loads, despite their higher initial costs, Mr. Mas stated that the presentation did not include the full suite of sensitivities (such as for ground source heat pumps) and more community-based applications of them, but that will be presented in the future.

Dr. Howarth observed that the buildings sector was becoming closer to achieving the Climate Act requirements, while the transportation sector still appears to be much lower than that which is required. Mr. Mas responded by stating that, despite that the transportation sector has become more efficient overall, the transportation sector will take more time given the current state of affairs which includes more driving and driving of larger vehicles and that there will be trade-offs with the other sectors likely needing to fill the gap.

In response to an inquiry from Dennis Elsenbeck regarding the magnitude of the transformation and the affect it could have on advanced manufacturing and rust belt communities, Mr. Mas solicited additional input from the Council for the Just Transition opportunity proposition that could drive the potential for the creation of hundreds of thousands of jobs. He stated that analytical work is forthcoming that examines the coupling of the infrastructure transformation with new manufacturing opportunities within the State.

With regard to an inquiry by Mr. Elsenbeck regarding the relationship between early facility retirements and higher costs, Mr. Mas stated that there wasn't a huge percentage of available stock modeled and one must consider the trade-off of more expensive fuels against an accelerated transition, along with other factors, such as the cost of more equipment against the potential for a larger grid due to acceleration.

Mr. Mas confirmed the examination of medium-and heavy duty off-road construction vehicles and agriculture vehicles in the transportation analysis in response to an inquiry by Mr. Elsenbeck.

In response to an inquiry by Donna DeCarolis regarding any analysis that may have addressed the rapid adoption of electrified technologies, such as for colder climates or prioritizing oil conversions, Mr. Mas stated that the different climate zones and New York State Independent Operator System zones are considered, along with building type and needs and the congestion situation. Scenario 2 considers back-up heat for certain zones, as well. Given the goals, all fuels will be considered. A much more granular buildings roadmap is also being pursued through the use of additional modeling tools. Regarding heat pumps, the analysis assumed 1.5 to 2 million heat pumps installed with a useful life of between 15 to 20 years, depending on the application.

In response to a request by Ms. DeCarolis to provide a glossary of terms, Mr. Mas agreed to extract the key definitions and provide a table of key terms, some of which are provided in the cost framework.

In response to an inquiry by Gavin Donohue regarding how the Regional Greenhouse Gas Initiative activities are portrayed in the reference case analysis, particularly for the transportation and clean buildings sectors, Mr. Mas emphasized that is a critical funding source for investing in decarbonization. He stated that while there is not a direct mapping to those dollars invested, he provided examples, such as New Efficiency NY and the electric vehicle adoption efforts that are embedded in reference case.

In response to an inquiry by Mr. Donohue regarding the magnitude of changes that will be needed across many sectors that will likely require customer incentives and whether the current State incentive structures in place are adequate or necessitate a new suite of regulations and laws, Mr. Mas stated that is an issue for the Council to discuss and debate, along with the wealth of information provided by the Advisory Panels.

In response to an inquiry by Chair Christian regarding whether the building shell improvements were related to code changes applicable to new construction, Mr. Mas clarified that it was referencing the retrofitting of existing buildings to bring them to a level of conformance that meets or exceeds existing building codes. He added that the analysis makes assumptions about how often there may be a major retrofit of an existing building, or the “opportunity spaces”, which often occurs at the point of sale.

In response to an inquiry by Chair Christian about how many customers may retain natural gas as their back-up fuel upon a switch to an air source heat pump, Mr. Mas responded that in the early years any existing turnover of gas systems is to a more efficient system and fairly quickly, by 2024 or 2025, the gas curve really begins to bend. Mr. Mas stated that the assumption is that there will be hundreds of thousands of annual upgrades. In response to a related inquiry, Mr. Mas stated that an “efficient” electrification

process is assumed whereby a holistic building upgrade will occur, rather than only a single system upgrade. Mr. Christian observed, and Mr. Mas agreed, that given the magnitude of the challenge, a more holistic, rather than prescriptive, approach is what is necessary going forward.

In response to an inquiry by Raya Salter about how the presented scenarios reflect early action in reducing pollutants and co-pollutants in disadvantaged communities and how the final disadvantaged community criteria with the specified mapping will enhance that understanding, Mr. Mas stated that time is of the essence for building and transportation electrification and it is through implementation that certain community areas will be prioritized. He added that every part of the State will substantially benefit from these efforts.

In prefacing the discussion on the benefits and costs analysis approach, Mr. Mas reviewed the overall approach to the Integration Analysis that is being used to evaluate societal costs and benefits of greenhouse gas mitigation. He reminded the Council that the Pathways framework produces economy-wide resource costs for the various mitigation scenarios relative to a reference scenario; the outputs are produced on an annual time scale for the State, with granularity by sector; and locational and customer class impact analyses would be developed through subsequent implementation processes. The value of avoided greenhouse gas emissions will be calculated based on guidance from NYS Department of Environmental Conservation. The Integration Analysis also includes health co-benefits analysis to estimate and quantify health benefits of mitigation scenarios relative to a reference case, specifically examining ambient air quality at the county level, mobility and active transportation new health benefits, and the impact of low-to-moderate income programs where indoor air quality has been addressed. The Integration Analysis will also serve as a key input to the Just Transition Working Group Jobs Study, which is likely to reflect the addition of hundreds of thousands of jobs.

In discussing population and gross state product, Mr. Mas discussed the implications of the State having a \$2 trillion dollar economy. He also presented information on system expenditure defined as an estimate of the costs related to energy consumption, including capital investments for energy consuming devices, fuel costs associated with energy consumption, and the cost to generate electricity from in-State resources and imports. However, he cautioned that system expenditures, while meaningful, make up less than 10 percent of the gross state product, with total energy expenditures approximately \$50 billion, over half of which goes for energy imports.

Mr. Mas presented the key benefit-cost findings which included:

- The cost of inaction exceeds the cost of action by more than \$80 billion, with the net benefits

ranging from \$80-\$150 billion, and about 8% increase in overall system expenditures needed in 2030 and about 25% in 2050;

- Improvements in air quality, increased active transportation, and energy efficiency interventions in low-to-moderate income homes generates health benefits ranging from \$160-170 billion;
- Reduced greenhouse gas emissions avoids economic impacts of damages caused by climate change equaling approximately \$260 billion;
- Net direct costs in both scenarios are in the same range given uncertainty and are primarily driven by investments in buildings and the electricity system;
- All scenarios show avoided fossil fuel expenditures due to efficiency and fuel-switching relative to the Reference Case;
- Scenario 2 includes significant investment in renewable diesel, renewable jet kerosene and renewable natural gas;
- Scenario 3 meets emission limits with greater levels of electrification which results in greater investment in building retrofits, zero-emission vehicles, and the electricity system;
- Change in direct costs over time is moderate relative to total system expenditure in 2030 and 2050;
- When calculated on a Net Present Value basis, the net direct costs are moderate – about 10-12 percent higher than the Reference Case; and
- Mitigation cases show positive net benefits (\$80-\$150 billion) when considering the value of avoided greenhouse gas emissions and health co-benefits, in addition to cost savings from reduced fuel use.

In response to an inquiry by NYS Public Service Commission Chair Rory Christian regarding granularity relative to New York State Independent System Operator zones and with regard to health benefits, Mr. Mas provided additional details as to the approaches taken. Chair Christian expressed his interest in county level breakdowns of health benefits by scenario, finding it incredibly valuable. In response to an inquiry by Chair Christian as to whether job benefits are broken down in a similar manner, Mr. Mas stated that statewide and regional granularity will be the approach to avoid the false precision of a county-by-county approach. As for the \$50 billion investment in energy, \$30 billion of which is exported outside of the State, Chair Christian inquired as to an associated job statistic that could be translated into new jobs within the State associated with the \$30 billion.

In response to an inquiry by Dr. Shepson regarding the comparison of costs between 2030 and 2050, Mr. Mas confirmed that those costs are presented in current dollars. Dr. Shepson also found the estimate of net benefits to be impressive and a reminder of the importance of an aggressive public relations campaign in the State to impress upon the public the importance of their investments in clean energy technologies. In response to his inquiry as to whether analysis had been undertaken regarding the net difference between benefits and costs as a function of the rate of implementation, Mr. Mas stated that a more aggressive implementation sensitivity rate could be modeled and agreed that there is a tension between the increasing value of carbon over time, yet more weight is placed on early actions.

In response to an inquiry by CEO Falcone regarding incremental investment in the electric sector, particularly for infrastructure, Mr. Mas confirmed that analysis has been conducted for the new generation infrastructure by zone.

In response to an inquiry by Dr. Howarth regarding whether ozone was examined, Mr. Mas stated that it is not explicit, although nitrogen oxide avoided is analyzed and does turn into secondary particulate matter. Dr. Howarth commented that the total costs presented today are about half of what was projected in earlier research conducted by himself and Mark Jacobson, which he stated may be a reflection of lower technology costs, but that the value of health benefits of his study effort were also larger in part owing primarily to a projection of about 4,000 premature deaths annually due to fossil fuel use and based on U.S. EPA modeling. Dr. Howarth also pointed out his belief in the value of considering ammonia as a regulated pollutant. Mr. Mas confirmed that the health benefits are likely conservative as toxics were not modeled (due to the complexities), and instead focused on the largest ambient air quality issues in the State.

In response to a series of inquiries by Donna DeCarolis regarding (1) the cost curves that are being assumed for each of the technologies over the timeframe; (2) if there is a cost curve for the per kilowatt cost of electricity during the transition; and (3) if analysis has been undertaken on the ultimate cost impact on consumers, including the transition and operating costs for average groups of consumers, Mr. Mas confirmed that some cost curve information has been made available on the resources section of the Climate Act webpage and encouraged feedback from others as to what cost curves may still be needed. As to the issue of cost to consumers, Mr. Mas explained that costs are presented in a manner that addresses the fact that it is the type of policy implementation that determines who pays for the costs and who the primary beneficiaries are. He emphasized that the magnitude of investment necessitates a public-private partnership to bring forward this kind of transformation.

In response to an inquiry by Kevin Hansen, Senior Vice President and Head of Public Policy, Empire State Development, as to how economic development benefits such as personal income to New Yorkers, tax revenues from jobs and investments are treated and whether they are captured in the benefits, Mr. Mas clarified that the macroeconomic impacts of job creation are not included in this microeconomic analysis of costs and benefits, and the activities described by Mr. Hansen would be considered an additional benefit.

In response to an inquiry by Rose Harvey about incremental costs and investments, Mr. Mas agreed that those incremental costs are real and are offset by fuel savings, necessitating consideration of the fuel life cycle of the product. Mr. Mas agreed with Ms. Harvey regarding the importance of presenting the micro and macroeconomic analysis and health and jobs benefits together, which is the intention.

In response to an inquiry by Dennis Elsenbeck regarding the need to develop new technologies in a manner that co-locates them with load centers, accounts for integrated resource planning, and combines strategies (such as marrying economic development with infrastructure challenges), Mr. Mas agreed this is consistent with that which Chair Christian advocated in that the electric grid must be addressed in a systems way, rather than with a piecemeal approach. He cited the Power Grid Study as setting the tone in its addressing both the local distribution system and the bulk transmission system together in one space.

In response to an inquiry by Gavin Donohue regarding whether carbon pricing is being used to defray at least some portions of the cost estimates, Mr. Mas stated that the articulation of how to achieve the scale of the investments that might be needed, and the fuel savings, is the role of the Council and the Scoping Plan. He added that he is assessing the potential need for additional tools that may be needed to inform the role of carbon pricing.

Given the complexity of ozone and additional fine particulate matter benefits owing to air chemistry, in response to an inquiry from Dr. Shepson as to whether the human health benefits may be even greater, Mr. Mas stated that the analysis considers both the direct and the indirect fine particulate matter but that this specific issue is an order of magnitude less and, thus, not necessarily the focus of the analytical tools.

Raya Salter expressed her opinion that the benefits presented may be very conservative and encouraged a deeper look into toxics, ozone, ammonia, and the negative impacts of residential gas use, particularly as the focus on disadvantaged communities increases. Ms. Salter also expressed her support for systems thinking and coordinated planning. In response to a further inquiry as to how resilience is addressed in the analysis, Mr. Mas stated that, while this will not be a resilience plan, some climate change impacts and reliability standards have been factored in and future work includes an examination of a resilient and low-carbon system; the Climate Assessment will bring both of those efforts together, including thinking about resilience and hardening in the context of a new type of grid.

Raya Salter emphasized her observation that moving away from combustion scenario appears to be a win-win situation when considering costs and Mr. Mas agreed that there is a fairly strong positive narrative owing to the resultant net benefits, while cautioning about false precision and the bands of uncertainty.

Peter Iwanowicz emphasized what he considers to be the tremendous wastefulness of internal combustion, particularly in the transportation sector, which drives up general and healthcare costs. He

highlighted Ms. Salter's point that Scenario 3 is likely less costly and more beneficial and also the equity pathways as presented by the Climate Justice Working Group.

Regarding the earlier discussion on resilience, Commissioner Dominguez inquired as to how the additional costs for resiliency and hardening would be considered in the analysis and Mr. Mas explained the methodology used and the extent to which these concerns were included.

Mr. Mas presented information on the electricity system sensitivities beginning with the electricity system cost impacts and the implications of certain technology choices in controlling for electrification loads, such as the use of hydrogen, renewable natural gas or the absence of nuclear plant relicensing. With that backdrop, Mr. Mas introduced Kevin Steinberger, Associate Director of Resource Planning and Practice at Energy and Environmental Economics, Inc. (E3) to specifically discuss the need for and role of firm zero-carbon resources under Scenarios 2 and 3.

Mr. Steinberger stated that the expansion of wind, solar, and battery storage will be foundational in meeting the requirements of the Climate Act and to meet increasing demand as businesses, manufacturing, and transportation electrify their operations. Large amounts of firm zero-carbon energy sources will be necessary to maintain reliability and could be met by hydrogen fuel resources. The annual generation of electricity across both mitigation scenarios is comprised of 36-40% solar, 31-34% wind, 1-3% zero-carbon firm resources. Wind, water and solar combined will meet 90-95% of need by the year 2050 and generation by 2050 under Scenario 3 is slightly higher than that of Scenario 2.

In analyzing a typical spring week in 2050, Mr. Steinberger stated that existing clean, firm, zero-carbon resources (nuclear, hydrogen, bioenergy), when combined with wind, solar, and battery stored electricity, will exceed typical demand, allowing excess renewable energy to produce hydrogen or charge a long duration storage solution.

In analyzing a challenging week in mid-winter, solar and wind power production decreases and there is a need for extended periods of zero-carbon firm capacity to meet the electrical demands. It is estimated that New York will become a winter-peaking state by 2035, with peaks substantially higher than those of summer by 2050 as electrified heating increases. In the deep winter weather scenario, renewable production will be low for several days, coupled with very low temperatures and higher demand for heating. Output during this time will be low and zero-carbon firm capacity will be necessary to maintain reliability of the system. That said, an overbuild of solar, wind and short-duration batteries to meet the same need as the firm-capacity zero carbon will likely be found to be cost-prohibitive. Mr. Steinberger showed the modeling results from replacing zero-carbon firm capacity with long-duration storage and

additional renewables. The analysis showed that it is possible to meet the same reliability through a combination of other energy resources under Scenario 3 using long duration storage coupled with additional renewable energy. Revisiting the typical winter week of energy demand, Mr. Steinberger showed that the combination of additional offshore wind, solar, and 100-hour long duration storage could ultimately be sufficient to meet anticipated demand during this week in 2050.

In response to an inquiry from Dr. Bob Howarth inquiring as to whether ground source, rather than air source, heat pumps had been considered as a winter heat source and the potential for thermal storage, Mr. Mas stated that those options are being assessed, stressing the great potential for ground source heat pumps, agreeing with Dr. Howarth that once cost barriers are resolved, ground source heat pumps could become one of the least expensive methods of winter heating.

In response to an assessment by CEO Falcone on the potential cost of the additional off-shore wind, solar, and the long-duration storage scenario presented, Mr. Mas responded that a cost analysis has not been completed but is being examined. Chair Christian also stated his interest in a cost analysis and understanding the magnitude of the costs when coupled with related infrastructure needs.

In response to an inquiry from Mr. Donohue as to whether the analysis considered retaining renewable energy credits, investments and energy jobs in New York State, Mr. Mas stated that the Integration Analysis includes the base assumptions included in the NYS Public Service Commission Clean Energy Standard Orders. Mr. Mas added that the Council may need to discuss policy mechanisms and other implementation options to achieve the ultimate goals.

In response to an inquiry by Mr. Donohue as to whether the New York State Independent System Operator had been involved in this specific analysis, Mr. Mas responded that feedback will be solicited.

In response to an inquiry from Mr. Elsenbeck regarding the need for additional focus on managing the demand side and for additional flexible load, Mr. Mas agreed that the demand side is a priority and that the focus on flexible supply tends to be forward looking to ensure that the grid can handle the demand. Mr. Elsenbeck added that he finds micro grids a compelling option for local resiliency and to address the changing use patterns and load profiles.

In response to an inquiry from Ms. Salter as to the impact of grid modifications, interconnections, and load shifts on locally-owned renewables and distributed energy resources as the Climate Act requires

an examination of the effects on local and community-owned renewables, Mr. Mas responded that, while the model lacks the granularity to specify where renewables would be located, it provides an overall understanding of the types and amounts of renewable technologies will be needed. This provides opportunities to determine where to locate renewables to maximize the community benefits.

In response to an inquiry by Donna DeCarolis as to whether any additional modeling was undertaken on the greater use of low carbon fuels, Mr. Mas stated that increasing the amount of renewable natural gas was modeled due to the substantial need for firm zero emissions resources. However, the cost of the additional gigawatts needed is substantial, thus the model shows a preference for the lower cost solar, wind, and related energy storage over the higher cost fuels which are still needed to meet peak demand.

Regarding an inquiry from Ms. DeCarolis as to whether any modeling was done to scale-up the potential for increased use of air source heat pumps with fuel back-up (similar to a study done in New York City) as a means to reduce winter peak, Mr. Mas responded that Scenario 2 does include a higher rate of dual-use fuels than Scenario 3.

Mr. Mas presented results from the health effects analysis by highlighting the importance of wood smoke considerations on the health of New Yorkers. The analysis includes three components: (1) improvements in ambient air quality from reduced fuel combustion; (2) health improvements from increased active transportation; and (3) health benefits associated with energy efficiency interventions in low- and moderate-income homes. Key findings from the analysis include:

- Decarbonization of New York can result in a substantial health benefit from improved air quality, on the order of \$50-\$120 billion by 2050 (based on reduced mortality and other health outcomes);
- Benefits would be experienced throughout the State and downwind in neighboring states and annual benefits grow over time as pollution rates decrease; and
- Other related potential health benefits include \$40 billion associated with the health benefits of increased active transportation, walking, and cycling; and \$9 billion associated with energy efficiency interventions in low- and moderate-income homes.

Mr. Mas described the human impacts of ambient air quality improvement which can avoid tens of thousands of premature deaths, thousands of non-fatal heart attacks, thousands of other hospitalizations, thousands of asthma-related emergency room visits, and hundreds of thousands of lost workdays. The highest impacts to overall health benefits are from reduced wood combustion Upstate, and all other reduced combustion Downstate. In addressing sector analysis, Mr. Mas stated that the analysis was only a snapshot rather than a seasonal analysis. The analysis showed that roughly two-thirds of particulate matter emissions are from non-combustion sources, such as road dust and aerosols, but a meaningful amount does come from combustion, primarily residential and commercial wood burning. While the amount of

wood being burned is low, it is much dirtier when compared to other fuels which have benefitted from positive state and federal policies, leading to significant particulate matter emissions.

Mr. Mas explained that the nitrogen oxide emissions are the inverse of particulate matter, with the majority of emissions from combustion sources, and half of those combustion emissions from commercial and residential fossil fuel combustion. On-road vehicle contribution to nitrogen oxide has been reduced through Clean Air Act and other measures, but still contributes roughly one-quarter of nitrogen oxide combustion emissions. These emissions are expected to drop as electric vehicles become more available and building fuel combustion transitions toward electrification. The most substantial health benefits in the Scenario 3 model come from eliminating wood combustion and on-road and non-road particulate matter.

Mr. Mas stated that overall health benefits per capita under both Scenarios will be significant, and although tend to be higher in urban areas such as Buffalo, Rochester, and New York City, benefits will accrue throughout the State. Downwind states, such as Vermont, New Hampshire, Massachusetts, and Maine, will also benefit. When woodsmoke particulate matter emissions are removed from the equation, the benefits are primarily concentrated in New York City and the Hudson River corridor, but with the remainder of the state and downwind states receiving a lower, yet measurable, level of benefit. Using this information, it will be important to identify disadvantaged communities and coordinate with the emissions reduction estimates to ensure the affected communities and surrounding areas are receiving appropriate benefits.

Mr. Mas discussed the active transportation health benefits that used the Integrated Transport Health Impacts Model (ITHIM) and found health benefits will be two-fold in that individuals will be healthier with increased levels of exercise from walking and biking, and decreased injury and death from vehicle related accidents, while reducing emissions.

Results from energy efficiency benefits under both strategies are significant according to literature and studies. Most of the research addresses low-and moderate-income homes, as well as multi-family homes, which comprise a substantial portion of housing in New York. Most substantial indications are reduced asthma related incidents as indoor air quality improves, and reduced thermal stress from heat, including both more heating in the winter and less heat stress during the warm summer months. Overall, approximately \$8.7 billion in health benefits could be realized by 2050.

Mr. Mas provided a brief overview of the potential carbon pricing analysis and the exploration of options for analyzing potential carbon pricing policies. Research could explore how economy-wide carbon pricing might impact gross state product, the demand for labor, emissions and other considerations. Mr. Mas stated that a dynamic macroeconomic model is required that will assess the intrinsic impact of any pricing policy as to the total energy expenditures in the different sectors, whether the policy has disproportionate impacts on particular segments of the economy, as well as assessments of energy justice. Leakage risk will also be examined in the event New York proceeds with carbon pricing while the rest of the U.S. economy does not. Mr. Mas stated that the analytical team believes it has sourced a model that may be compatible with the need and hopes to report back with a plan to move forward with this work.

Henry Spliethoff commended the Team for this body of work and emphasized that although the health benefits were presented as large, they very well may be conservative given the amount of and additional types of benefits that may not have been fully analyzed. He looks forward to more refined modeling of this nature in the future. Mr. Mas agreed that he believes the estimates to be conservative and thanked the NYS Department of Health team for their assistance and for championing these issues.

Dr. Howarth also expressed gratitude for the in-depth work and called upon the Council to diligently work to determine the funding mechanism for the separate scenarios, including the potential for a carbon fee and its application among sectors, citing several examples of how one could potentially apply to the buildings sector, portions of the transportation sector and approaches to increasing the deployment of heat pumps. Co-Chair Harris agreed that the “what” has been articulated well and it is now time to deliberate on the “how” in the context of the Scoping Plan during 2022. Co-Chair Seggos suggested that a strategy for starting the debate is important and should be developed.

In response to an inquiry from Co-Chair Harris regarding timelines, Mr. Mas emphasized the importance of not perpetuating analysis paralysis, and using the information presented to move forward with finding solutions rather than becoming bogged down in more detailed analysis of the same issues.

In response to an inquiry by Ms. Salter regarding distribution of proceeds as a result of implementation of any new policies or principles, Mr. Mas stated that it is for the Council to prioritize and determine how best to proceed to ensure that disadvantaged communities receive the appropriate support. Based on the analysis, Mr. Mas believes that building and transportation will require the most economic support due to their importance in reducing overall greenhouse gas emissions, but that is a conversation to be had regarding this complex work.

In response to an inquiry from Mr. Elsenbeck regarding the different incentive structures offered between the State and individual municipalities and whether anyone has analyzed ways to better engage municipalities in administering the same types of incentives and programs, Mr. Mas stated that he believes that is appropriately addressed through the Scoping Plan.

Mr. Donohue expressed concern about the ability of the Council to appropriately determine the structure and implementation of carbon pricing without additional resources and requested that the Co-Chairs undertake additional consideration of this concern. Co-Chair Harris stated that she is willing to continue to probe on that topic and believes this is the first time that the scale of the needed investment to meet the goals of the Climate Act has been presented. This will allow the Council to engage in a more fruitful discussion for the draft Scoping Plan.

Mr. Iwanowicz expressed his belief that he has been presented with a good sense of the benefits and he suggested, to Mr. Donohue's point, that the Council has yet to determine how to pay for the implementation of the strategies that will be adopted to meet the goals of the Climate Act.

Presentation and Discussion: Draft Scoping Plan Walk-through

Sarah Osgood, Executive Director, Climate Action Council presented an overview of the initial draft Scoping Plan that has six main sections: Overview; Pillars of New York's Plan to Realize Net Zero Emissions; Evaluation of the Plan; Sector Strategies; Statewide and Cross-Sector Policies; and Measuring Success. The Pillars of New York's Plan will include chapters related to fundamental objectives of Climate Justice, a Just Transition and Health, with recommendations in this section only appearing in the Just Transition chapter. The Sector Strategies sections will contain the recommendations emanating from the Advisory Panels and the Integration Analysis. Ms. Osgood presented a mapping slide depicting how each topic area and category is planned to be presented within the Scoping Plan chapters, with each of the chapters having similar formats, comprised of an overview of the sector and vision for both 2030 and 2050, existing mitigation strategies, and key sector strategies, which are generally divided into themes. She noted that the draft Scoping Plan will also contain a number of technical appendices.

Next Steps

Sarah Osgood presented the next steps for the Council through the remainder of the year. The initial draft Scoping Plan will be provided to the Council in late October. The November 2021 Council meeting is also earmarked for a report on the Jobs Study and to discuss Council member feedback on the initial draft Scoping Plan. The revised draft Scoping Plan, including a discussion of any changes made, as well as any potential action will be the subject of the December 2021 Council meeting. Ms. Osgood will also review the schedule to determine if additional Council member requests expressed at this meeting can be accommodated.

In response to a clarifying question from Mr. Iwanowicz regarding the small group sessions, Ms. Osgood stated that they are planned the same as prior small group sessions. Mr. Iwanowicz expressed his desire to have the small group meetings be public, and Ms. Osgood responded that because a draft Scoping Plan has not been seen by Council members, it is important for the public to receive a draft Scoping Plan that reflects the true preferences of the Council, rather than a working draft. Ms. Harvey agreed with the planned approach and that the public has the opportunity to go back and review any draft they would like.

With that, the meeting was adjourned.



Climate Action Council

KATHY HOCHUL
GOVERNOR

DOREEN HARRIS
CO-CHAIR

BASIL SEGGOS
CO-CHAIR

Meeting Agenda

October 14, 2021

- Welcome
- Consideration of October 1, 2021 Minutes
- Presentation and Discussion: Integration Analysis Scenario Results
- Presentation and Discussion: Draft Scoping Plan Walk-through
- Next Steps