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February 10, 2022

Senate Energy and Environment Committee

Introduction

Good morning Chairman Smith, Vice-chair Greenstein and Members of the Committee. I would like thank you for inviting me to speak with you today and giving me the opportunity to discuss both the threats we face from climate change and the efforts undertaken by the Administration to combat the threats.

A recent United Nations Intergovernmental Panel on Climate Change report referred to our current situation as “a code red for humanity.” The UN report verified what most of us already knew, that climate change is affecting nearly every part of our planet, it is intensifying, and some of its consequences are, or soon will be, irreversible. The evidence is irrefutable. An increase in Greenhouse gasses, a majority of which result from human activity, is placing the planet and every human on it in danger. We certainly see the impact of climate change right here in New Jersey, and the impact is only worsening.

Under Governor Murphy’s leadership, the State is taking concrete, actionable steps, to allow us to reach a goal of 100 percent clean energy by 2050. New Jersey’s Clean Energy Program, administered by the Division of Clean Energy in the Board of Public Utilities (the Board), is at the core of our whole of government approach to the State’s efforts to reduce the impacts of climate change.

At the same time, the Board takes seriously the need to keep energy costs affordable for all New Jerseyans. As I will mention throughout my remarks today, the Board is focused on bringing down the cost of clean energy, because there is simply no separating the fight against climate change from issues of energy affordability. I assure you, the Board clearly identifies the costs of each of its initiatives before they are

1x

enacted and we are continually assessing and reassessing the best way to deliver economic, climate, and local health benefits to the residents of our State. The transition to clean energy not only helps reduce New Jersey's greenhouse gas emissions, but also diversifies our energy supply, reducing our exposure to volatile energy prices.

Impact of Climate Change

Over the last decade the impacts of climate change have been increasingly evident with an endless procession of storms that have been more severe and more frequent than any other time in our lives. In 2011, Hurricane Irene set a new record for electrical utility outages in the State when 1.9 million electric customers experienced outages. Full restoration of electric utility service took 8 days and all together, Irene caused roughly \$1 billion in damage to 200,000 homes and buildings, making it the costliest disaster in the State's history; though Hurricane Sandy would soon dwarf this.

The following year, Hurricane Sandy hit the east coast with maximum sustained winds of approximately 80 mph and unprecedented storm surge. Of the 12 northeast States significantly impacted by Sandy, New Jersey experienced the largest number of electric utility outages with approximately 2.7 million peak customer outages, representing approximately 70 % of all electric customers in the State. The negative impacts of Sandy shattered the records set by Irene in and full restoration of electric service took 14 days. Tragically, Hurricane Sandy took the lives of 37 people, and approximately 346,000 homes were damaged or completely destroyed. Hurricane Sandy was the most destructive storm ever recorded in New Jersey and the fourth-costliest hurricane in U.S. history.

New Jersey had a small reprieve after Sandy until the 2015 Bow Echo storms struck parts of Southern New Jersey with wind gusts up to 75 mph, interrupting service to over 400,000 customers. Following the Bow Echo, full restoration of communications and electric utility service took 7 days due to the extensive damage.

In March of 2018, New Jersey experienced a series of severe weather events that affected more than 1.2 million electric utility customers. Three consecutive nor'easters left some New Jerseyans without power for up to 11 days, and caused millions of dollars in property damage. The combination of three nearly back-to-back late-season storms, each carrying heavy, wet snow and intense wind gusts, was unprecedented.

In 2020, Hurricane Isaias ripped through the Caribbean, and up the East Coast, bringing 70+ mph wind gusts, flash flooding and tornados. Two New Jerseyans lost their lives due to the storm, and 1.3 million people lost power, some for up to seven days. Overall, Isaias caused approximately \$4.5 billion in damage in the U.S. alone.

And last year we were hit by Hurricane Ida, which killed 27 people in New Jersey. Ida was unusually intense and deadly, due in part to it being the third tropical system in as many weeks to soak the Northeastern United States. Along with significant flooding, Ida also resulted in 10 recorded tornados. Over 81,000 power outages were reported on the night Ida hit New Jersey. The tornados brought by

Hurricane Ida were not totally anomalous, as there have been 38 tornados recorded in New Jersey in the last decade according to NOAA.

The Board and the State's utilities have worked diligently over the last decade to harden the infrastructure in an effort to minimize the number of outages during any particular storm. We saw those infrastructure investments pay off in Ida, where we saw only 88,000 outages even though the flooding of low-lying areas and destruction of property was significant. One reason we experienced better outcomes in Ida was the flood mitigation investments directed by the Board at vulnerable substations that flooded in Sandy, helping to prevent a repeat of the multi-day outages that occurred during Sandy. These and other hardening measures are critical to improving our State's resilience in the face of extreme weather.

It is important to look back at the impact of the severe storms we have experience in the last decade and remember how significantly they have affected peoples' lives. Sea level rise and a global temperature increase of 2 or 3 degrees Celsius may seem abstract, but the major changes in weather patterns and the unprecedented number of super storms we have experienced does not. And to be clear, stronger storms are in no way the only impacts of climate change we face. Increasing heat in our urban centers, increasing health concerns such as asthma from growing emissions and nearly every facet of life will be impacted negatively. Unfortunately, we anticipate the trend of increasing global climate-related threats will continue to get worse. This is why it is so important for the Board to propel Governor Murphy's clean energy goals forward.

Energy Master Plan

As you know, the Board is responsible for updating the State's Energy Master Plan (EMP) every three years, which we did in consultation with our sister agencies in 2019. The 2019 EMP spans multiple sectors and governmental agencies and includes rigorous goals for energy efficiency, offshore wind, solar, transportation and much more. We will be updating the EMP this year, as required by statute, and again we will rely on robust public engagement in that process. The EMP is our guide for New Jersey's clean energy future. It is the roadmap to get us to 100% clean energy by 2050.

Energy Efficiency

Energy efficiency is one of the most affordable ways of reducing our energy demand and lowering emissions. Many of our dirtiest power plants operate on days when the demand for electricity is highest. By reducing the amount of electricity we use, we directly reduce carbon and other harmful emissions. And because those power plants also tend to be the most expensive, substantially reduce the cost of electricity as well. It is also a key economic driver for our clean energy economy. The transition required by the Clean Energy Act of 2018, for the first time, set energy efficiency targets and precipitated a 15-year effort by the Board to overhaul energy efficiency programs in the state. The Board has approved several utility-specific energy efficiency programs to help lower energy costs for customers, reduce greenhouse gas emissions, improve air quality, support environmental justice, and bolster the economy with new jobs. Energy efficiency projects are labor-intensive and therefore these initiatives help to support and develop local economies, and expand job markets.

We have made it a primary goal to ensure people in environmental justice and overburdened communities not only have access to energy efficiency programs, but also have access to the jobs that will be generated by them. To achieve this goal, the Energy Efficiency Workforce Development Working Group is developing recommendations for establishing coordinated and collaborative workforce development and job training pathways and pipelines statewide, with a focus on providing economic opportunities for underrepresented and socially or economically disadvantaged individuals. As you have heard me say before, the lowest cost energy is the energy we don't use, and when we combine that with exceptional job creation, the Energy Efficiency program is a true win-win for New Jersey.

Offshore Wind

Our growing offshore wind program is one of the centerpieces of our clean energy initiatives. Offshore wind is not only vital in providing clean energy and combatting climate change, but is critically important to the State's economy. To date we have approved 3,758 MW of offshore wind energy, which will get us halfway to Governor Murphy's goal of 7,500 MW of offshore wind by 2035. Last year, the Board approved two projects, 1,510 MW from Atlantic Shore Offshore Wind and 1,148 MW from Ocean Wind II, both of which will be built off the coast of Atlantic City. Our first offshore wind project, Ørsted's 1,100 MW Ocean Wind I, was approved in 2019 and will be built 15 miles off the coast of Atlantic City. Combined, these three projects will create over 7000 jobs, generate an estimated \$4.7 billion in economic activity and power more than one million homes with clean, renewable energy. Next year the Board expects to award additional projects from a third solicitation of at least 1,200 MW, which will keep us on schedule to reach the Governor's offshore wind goal.

A major component of our offshore wind goals includes transforming New Jersey into the East Coast supply chain hub of the U.S. offshore wind industry. New Jersey is taking advantage of our prime coastal location by developing the New Jersey Wind Port in Lower Alloways Creek, which is expected to produce another \$500 million in economic activity in South Jersey. The State has also invested in a state-of-the-art manufacturing facility to build the monopile foundations for turbines. The facility is currently under construction at the Paulsboro Marine Terminal and will create more than 500 high paying jobs.

The Board is also partnering with the Economic Development Authority in the development of offshore wind workforce development, education, research and innovation programs. The Board has approved \$4.5 million to support these workforce development projects and establish pathways for New Jersey students and workers to enter the offshore wind industry. The State has made a substantial investment in workforce development to ensure a modern workforce will be ready to fill all of the jobs being creating over the next several years to ensure the success of our offshore wind initiatives. All of these programs are designed to position New Jersey as the premier supply chain hub for all of the rapidly growing East Coast wind industry.

Solar

Our solar industry is a point of pride for us at the Board and a major component of our clean energy transition. With over 150,000 solar installations, New Jersey has the highest amount of installed solar per square mile. The industry supports over 6,000 jobs, and we are working to grow that number with a robust solar program via community solar development and by transitioning to our Solar Successor program to

ensure the industry's long-term viability. The current pipeline of solar projects consists of almost 1,700 MW, a historic high. The historic number of projects in the pipeline shows the strength of the industry.

Community Solar furthers the promise of environmental justice for historically underserved communities by removing barriers like cost and home ownership in order to increase access to the benefits of clean energy. Over the course of the Pilot Program, the Board conducted two competitive solicitations, and approved 150 community solar projects across the State, all of which will serve low- and moderate-income communities. Given our experience with the program and the knowledge gained in the first two years of the very successful pilot, the Board has elected to move directly to a permanent program, which we look forward to rolling out later this year.

Additionally, in application of legislative priorities set last year, Board Staff is currently working on proposals to implement the new competitive solicitation for grid scale solar, which will allow ratepayers to take advantage of competitive large scale solar to keep costs down. We will also be implementing a new dual use pilot program, which locates solar on active agricultural sites, to explore how solar development can be compatible with ongoing farm production.

Solar is our oldest success story in renewable energy and the demand has never been higher and we continue to reduce costs. In fact, the Board has reduced the cost of incentives per megawatt-hour of electricity produced by nearly 50% in the last two years. New solar systems installed today cost roughly half of what systems in the legacy Solar Renewable Energy Certificate, or SREC, program cost. To be clear, we are still paying for many of the legacy SRECs, but we continue to adjust our programs to bring costs down while still seeing an ever-increasing interest from the developer community.

Transportation Electrification

Another critical aspect of our energy future involves electrifying the transportation sector, which accounts for more than 40% of New Jersey's greenhouse gas emissions. After Governor Murphy signed Chairman Smith's electric vehicle (EV) law two years ago, the Board developed a program called Charge-Up New Jersey, designed to provide incentives to consumers who purchase electric vehicles. The first two years of the program were incredibly successful with the State providing incentives for the purchase of nearly 9,000 EVs. The Board also developed the Clean Fleet program, designed to provide incentives to government entities to purchase electric vehicles and build charging infrastructure. This program will move the State towards our fleet electrification goals.

EV infrastructure remains a critical piece in the electrification puzzle. To this end, the Board has also approved specific EV charging station plans proposed by PSE&G and Atlantic City Electric; and proposals by Jersey Central Power & Light and RECO are currently pending before the Board. The approved programs will help to incentivize over 1,300 fast chargers and 5,000 Level 2 chargers, all of which will be publicly accessible. These programs will help us to exceed the public charging goals set out in the electric vehicle law.

In the last year, we have established a number of programs designed to bring EV charging into our communities, including the Clean Fleet infrastructure program, designed to provide grants for public

entities to purchase electric vehicles and related charging infrastructure, and the EV Tourism program to provide grants to ensure that drivers have access to charging stations at tourism locations across the state. The Board also recently launched a Multi-Unit Dwelling EV charging incentive to ensure renters and other people living in planned communities have equitable access to electric vehicles. These are all critical components helping New Jersey to address the need for EV infrastructure and move us towards our goals. Using a similar approach to what the Board used to provide guidance on public charging build-out, the Board began a public stakeholder process to determine the appropriate role for utilities in the creation of Medium and Heavy Duty charging infrastructure. The Board anticipates releasing a revised straw proposal that builds upon public comments later this year. These programs will help build the ecosystem that will allow the State to reach its EV and clean energy goals.

Conclusion

We have heard a great deal about the cost of addressing climate change. In response, I would say two things: first, the Board always, in all of its decisions, considers ratepayer impact. Secondly, and I have said this before, the cost of doing nothing to address climate change is much greater than the cost of taking action. To be clear, there is no separating the climate change issue from the affordability issue, and we understand that. However, the Board's efforts in support of the Governor's clean energy vision are helping build a cleaner environment, fighting climate change while including an intense focus on workforce development to meet the demands of the clean energy economy, and bringing billions of dollars in economic development.

By investing in our clean energy workforce and infrastructure now, we can create thousands of jobs, strengthen our economy, and improve the health and safety of our residents for generations to come. Given the impacts of climate change, we cannot act quickly enough to put our programs in place. We must take action for the future of our children and grandchildren.

Once again, I would like to thank Chairman Smith and the rest of the Committee for allowing me to speak with you this morning.

Thank you.

Joseph L. Fiordaliso, President

Board of Public Utilities

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CONFRONTING NEW JERSEY'S CLIMATE CHANGE RISKS

BRIEF OVERVIEW OF THE MURPHY ADMINISTRATION'S PLANNING AND
REGULATORY INITIATIVES TO REDUCE AND RESPOND TO CLIMATE CHANGE

FEBRUARY 10, 2022



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CLIMATE IMPACTS IN NEW JERSEY

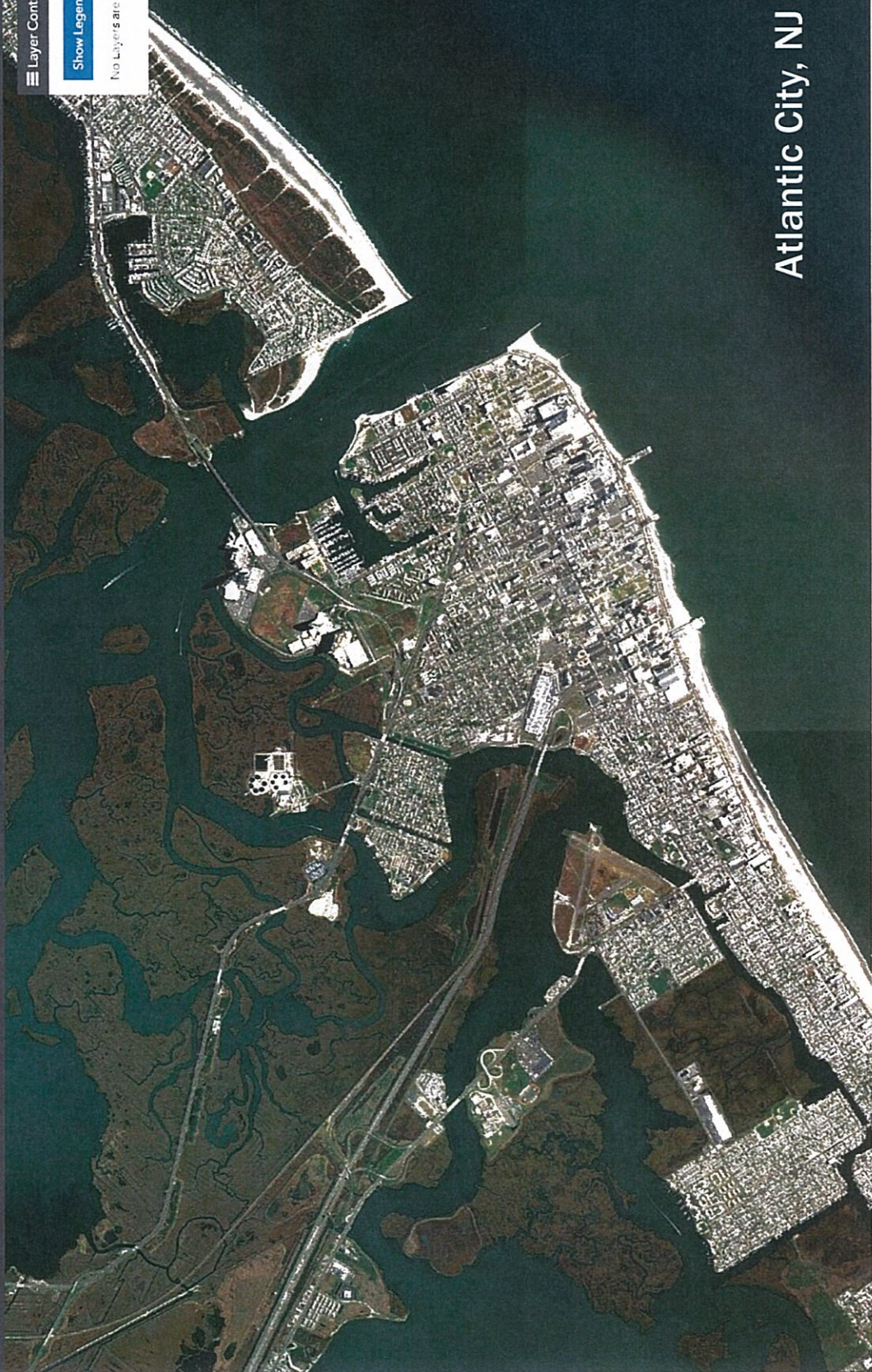
- Unprecedented warming for the 21st century – up 4 to 5.7 degrees by 2050
- Temperature increases will also intensify air pollution, as well as respiratory and cardiovascular health concerns, particularly in already overburdened communities
- Annual precipitation is expected to increase from 7% to 11% by 2050 – and will occur in more intense rain events, with a resulting increase in localized flooding
- Periods between rain events may be longer, causing more frequent drought conditions, possibly lower water supply availability, reductions in agricultural capacity
- Unabated carbon dioxide emissions also are increasing ocean pH – that is, creating a more acidic ocean – which will impact marine and estuarine life, and poses a significant threat to NJ's thriving fishing industry
- Changes in temperature, precipitation and sea level also will impact NJ's ecosystems, potentially negatively affecting our habitats and species. For example, it may be too hot for our state bird, the American Goldfinch, to nest in NJ.
- Wildfire seasons likely will lengthen or become more intense as a result of hot, dry periods
- Sea-Level in New Jersey is rising at more than 2x the global average (Guideposts: +2 feet by 2050; +5 by 2100)
- Increased coastal flooding during sunny days and storm events, impacting critical infrastructure, residents and businesses



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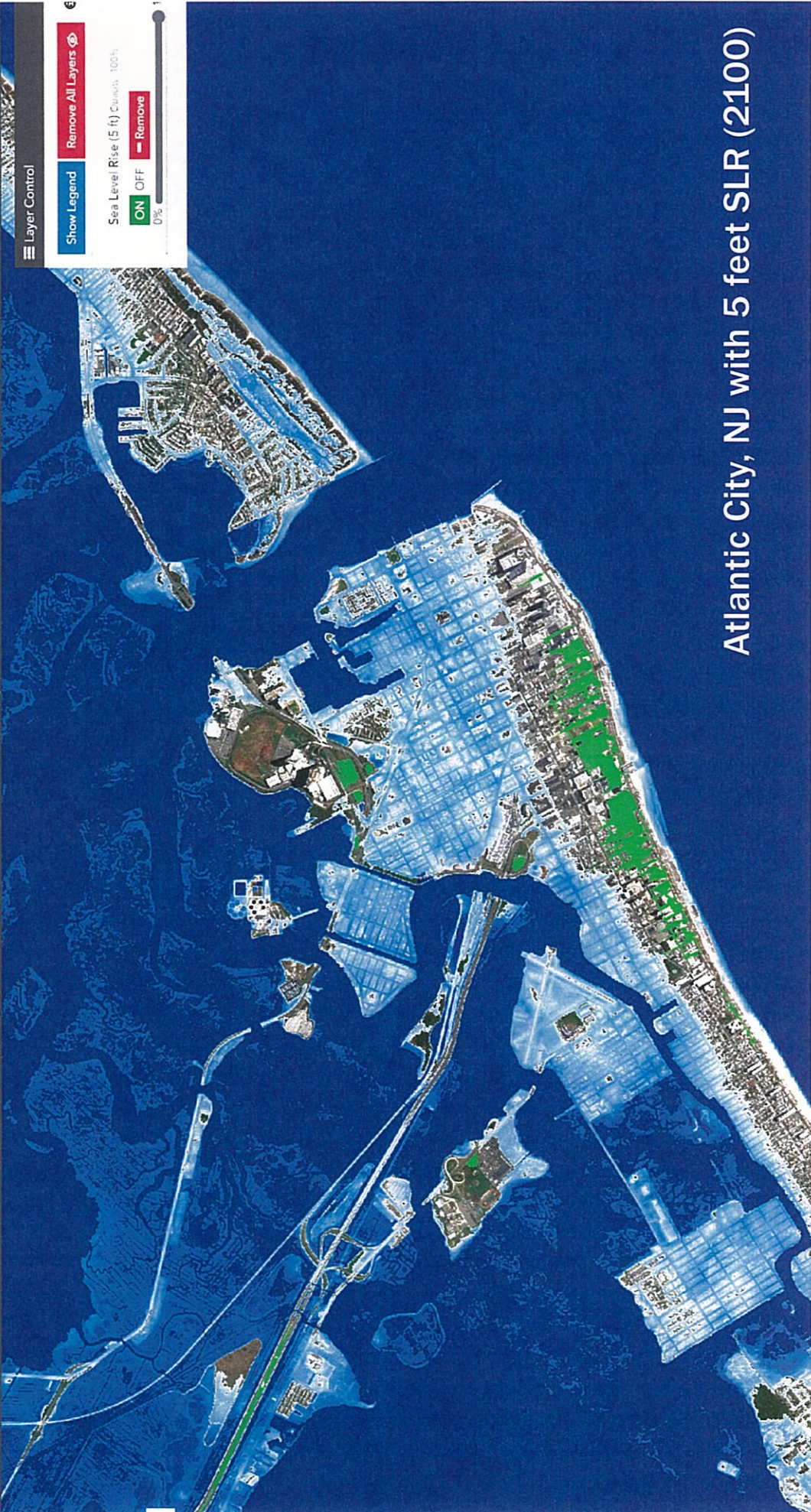
Atlantic City, NJ (present day)

107



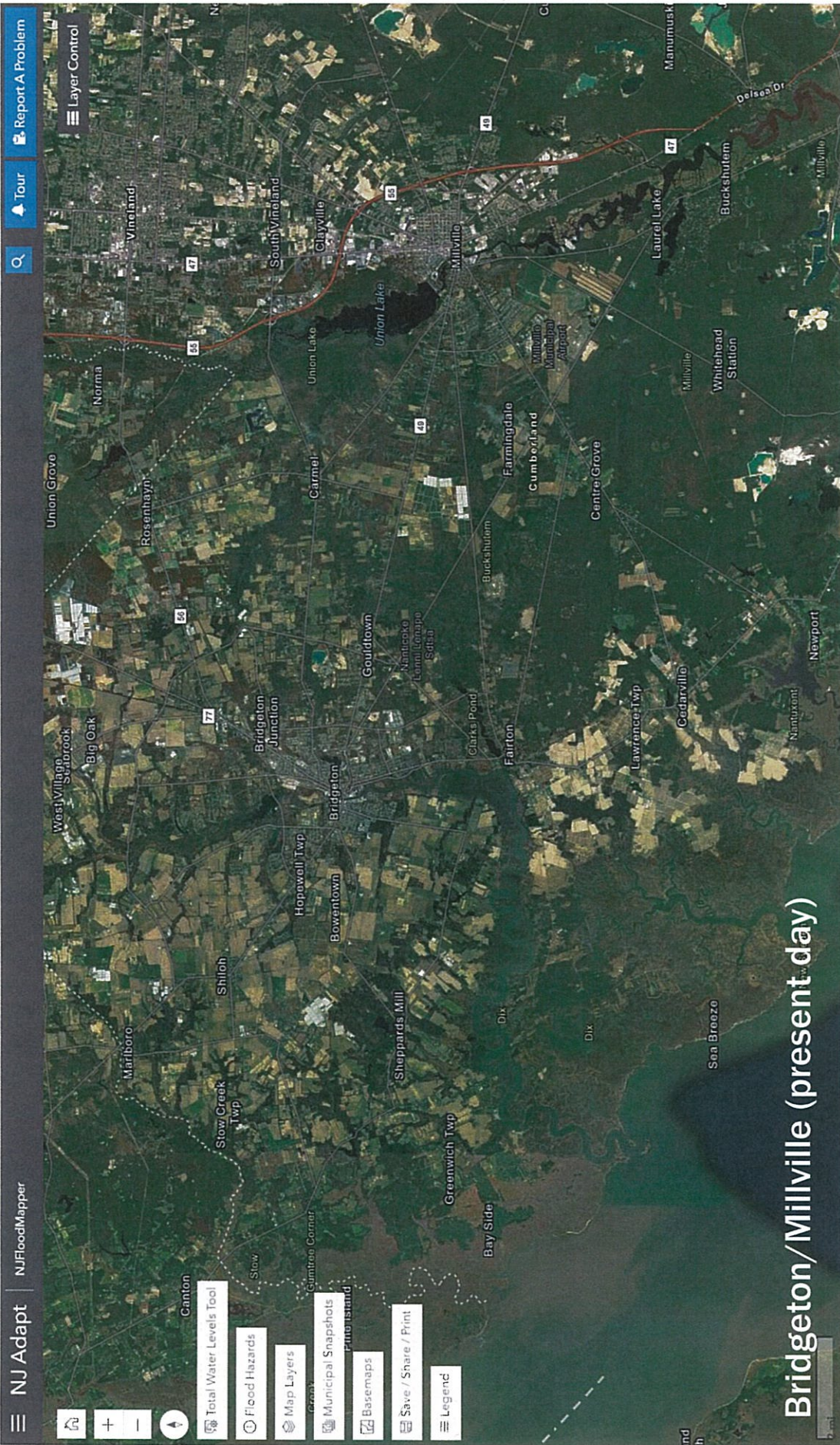
Atlantic City, NJ with 2 feet SLR (2050)

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Atlantic City, NJ with 5 feet SLR (2100)

125



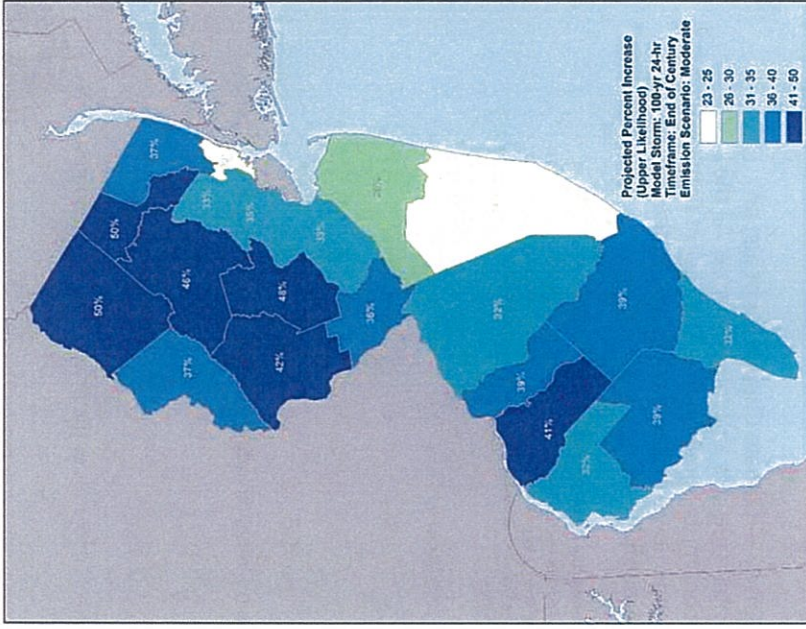
Bridgeton/Millville (present day)

13x

INTENSIFYING RAINFALL & FLOODING IN NEW JERSEY

- NJDEP and the Northeast Regional Climate Center, a National Oceanic and Atmospheric Administration (NOAA) partner, released studies in November 2021
 - confirming increases in precipitation across New Jersey over the last 20 years
 - projecting further increases in precipitation intensity through the end of this century due to climate change
- The data presently used to analyze flood potential in waterways and in the design of stormwater infrastructure is outdated—it includes data only through 1999.
- The precipitation expectations that presently guide state policy, planning and development criteria, and which rely upon data obtained through 1999, do not accurately reflect current precipitation intensity conditions.
- These new studies fill a two-decade data gap, allowing the state to plan and design projects based on current data, and reliably project future conditions.
- Precipitation is already 2.5% to 10% higher. Extreme precipitation amounts are 2.5% higher now than the 1999 data suggests, and some parts of the state have seen a 10% increase above the outdated data.
- Precipitation is likely to increase by more than 20% from the 1999 baseline by 2100, and projected changes will be greater in the northern part of the state than in the southern and coastal areas, with projections for some northwestern counties seeing the greatest increase, some by as much as 50%.

15x



NEW JERSEY
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

ECONOMICS OF CLIMATE CHANGE

One Example: Impacts from Hurricane Sandy

Climate Central study quantifying financial costs of Sandy damages that are attributable to anthropogenic sea-level rise.

- 13% of Sandy damages (\$8.1B) due to human-caused sea level rise across NJ/NY/CT.
- \$3.7B in NJ alone (50th percentile), estimated range: \$2.2B - \$7.0B.
- Approximately 24,500 people and 16,700 houses in NJ were exposed due to ASLR.

Accounting for Climate-Related Risk

"Uncertainty should not stand in the way of making prudent investments in risk-management practices in the near term to strengthen the financial sector against climate-related risks."

- Federal Reserve Governor Brainard

- Moody's, S&P, and Fitch have all [begun integrating climate vulnerability into municipal bond issuance](#).
- Realtor.com is now disclosing flood risk because buyers should know the "true cost of purchasing and maintaining the building, including the cost of insurance and repairing damage."
- March 16, 2021: the Securities and Exchange Commission [opened public comment on climate risk evaluation](#)
- April 22, 2021: FEMA opening public comment on changes to its programs to account for climate change (and EJ)
- May 20, 2021, President Biden Issued EO requiring analysis and mitigation of climate-related financial risk. The EO reflects demands of the private-market for domestic companies to provide clearer information surrounding climate risk.

[\\$1 in resilience saves \\$6 in recovery](#)



Secretary Janet Yellen
@SecYellen

...
.[@ClimateEnvoy](#) — Climate Change is not just an environmental issue, it is an economic issue. All the smartest economists agree on this: The cost of fighting climate change now is nothing compared to the cost of suffering through it later.

[Special Presidential Envoy John Kerry](#) [@ClimateEnvoy](#) · Feb 4
.[@JanetYellen](#) and I know that this is not a moment, it's a movement – so we're turning climate energy into climate action with climate finance. It is cheaper to prevent damage than it is to clean it up. Common sense. #HistoryIsHappening
Climate 🌱 Finance

5:37 PM · Feb 5, 2021 · Twitter for iPhone



NEW JERSEY'S CLIMATE POLICY: Reduce and Respond to Climate Change

REDUCE emissions of climate pollutants (climate mitigation)

- **Thought Leadership & Direction**
 - Energy Master Plan (2019)
 - Global Warming Response Act 80x50 Report (2020)
- **Incentives (to facilitate transition)**
 - Offshore Wind (ORECs) and Solar (SRECs) subsidies
 - Electric Vehicles Incentives (RGGI, ChargeUp)
- **Supportive Regulatory Reform**

NJPACT: New Jersey Protecting Against Climate Threats (EO 100)

- Climate Pollutant Reduction (CPR) rules
- CPR will gradually reduce emissions from: dirtiest power plants, heavy-duty vehicles and cargo handling equipment, dirtiest commercial and industrial boilers.
- Phase 1 proposals in process; complete in 2022

RESPOND to climate change through adaptation (climate resilience)

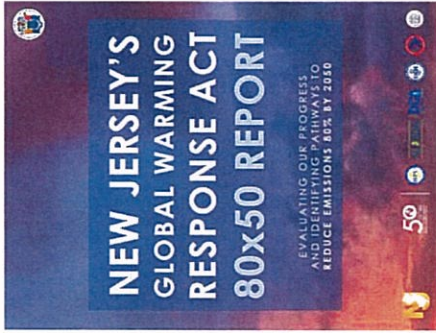
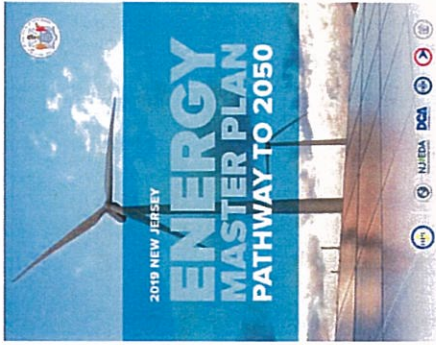
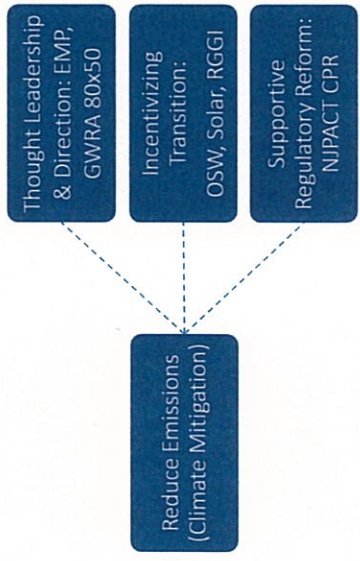
- **Thought Leadership & Direction**
 - NJ Scientific Report on Climate Change (2020)
 - NJ Climate Change Resilience Strategy (2021)
- **Incentives (to facilitate preparedness)**
 - Blue Acres Buyouts of Flood Prone Properties
 - ResilientNJ Planning Grants, Municipal Planning Assistance
- **Supportive Regulatory Reform**

NJPACT: New Jersey Protecting Against Climate Threats (EO 100)

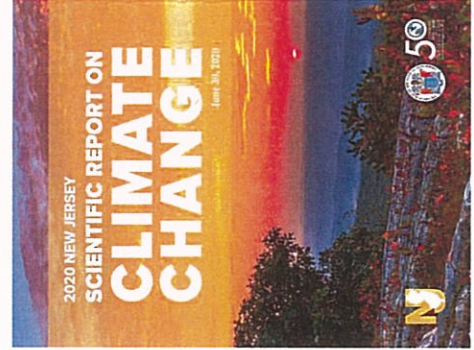
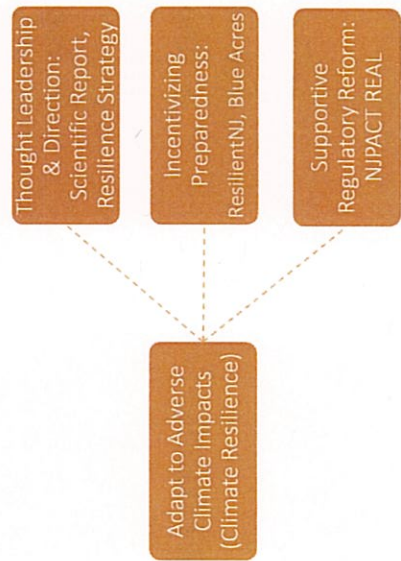
- Resilient Environments & Landscapes (REAL) rules
- REAL will amend environmental land use regulations to adapt for unavoidable impacts, such as sea-level rise, extreme weather, and chronic flooding. Changes will also advance watershed protection and lakes management goals.
- Phase 1 proposals anticipated Q2 2022



REDUCE



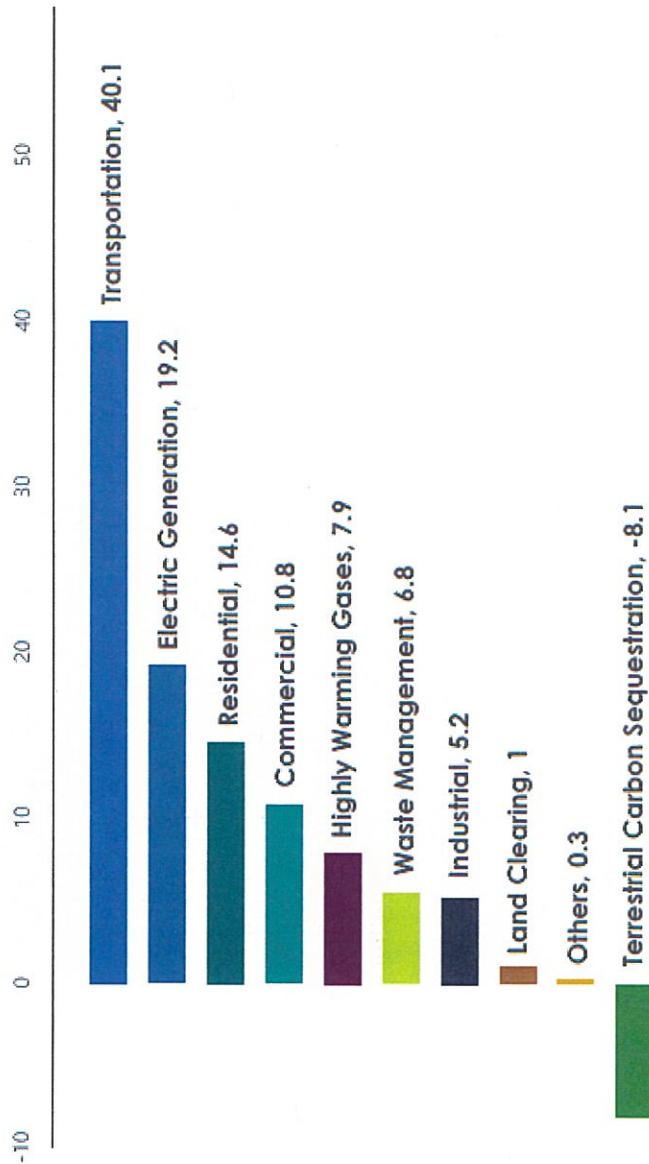
RESPOND



[Click Cover Page for Link to Each Report's Executive Summary](#)

NEW JERSEY'S GREENHOUSE GAS PROFILE

Figure 1. Projected Greenhouse Gas Emissions for 2019
In millions of metric tons CO₂e. Total net emissions 97.7 MMT CO₂e.



What is CO₂ MMT?

1 Million Metric Tons of CO₂ is comparable to...



214,133 Cars Driven for 1 Year!



Energy Consumed by 107,980 Homes for 1 year!

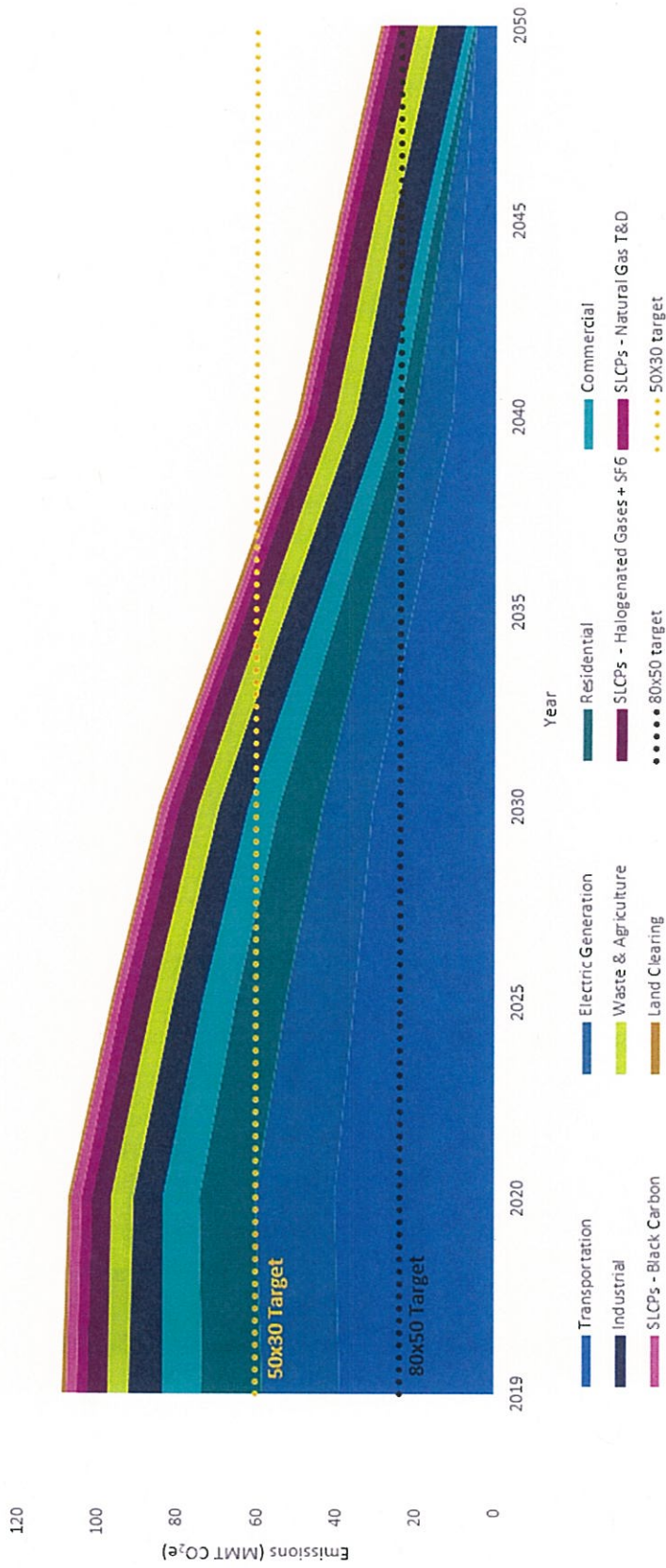
What is CO₂e?

CO₂ is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential (GWP) of 1

CO₂ equivalents are used to compare the emissions from various greenhouse gases based upon their Global Warming Potential.



NEW JERSEY'S PATHWAY TO 2050



20x

NJPACT

Climate Pollutant Reduction (CPR) Phase 1

To reduce emissions of greenhouse gases and other climate pollutants, NJDEP is proposing the first set of a suite of reforms to air quality regulations.

2/x

~8 MMT CO2e REDUCTIONS UPON FULL IMPLEMENTATION

Additional reductions in other harmful air pollutants, particularly in overburdened communities



Electric Generating Units (phase down use of dirtiest power plants)



Small Commercial and Industrial Boilers



Heavy fuel sales ban (low use in NJ, but high pollution)



Manufacturers EV Sales Requirements (Advanced Clean Truck Rule)



Pollutant Reductions from Medium & Heavy Duty Vehicles



Medium-Duty Vehicle Inspections (incl. vehicles not inspected now)



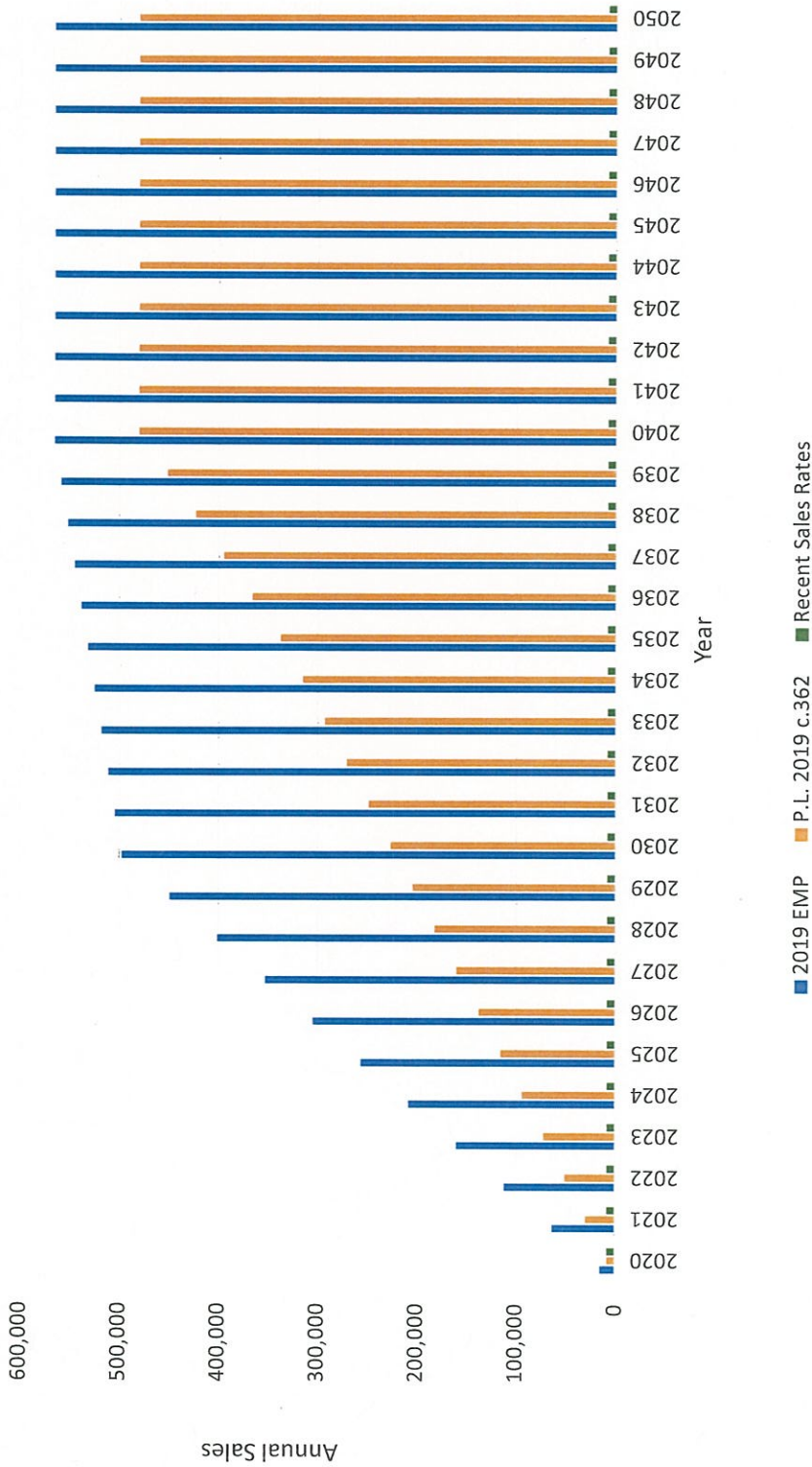
Cargo Handling Equipment Upgrade Requirements (cleaner diesel)



For general discussion purposes only. Information provided is pre-decisional and does not constitute a final agency decision or action.

TRANSPORTATION: EV PATHWAY

Comparison of Average Annual Light-duty Electric Vehicles Sales versus sales required to achieve the 2019 EV Law and the EMP EV projections

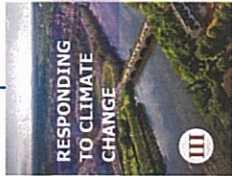
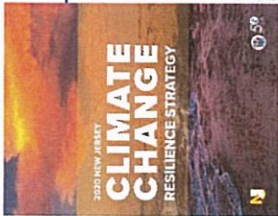


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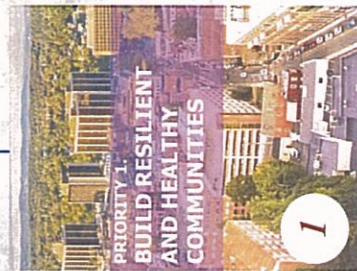
Interagency Council on Climate Resilience



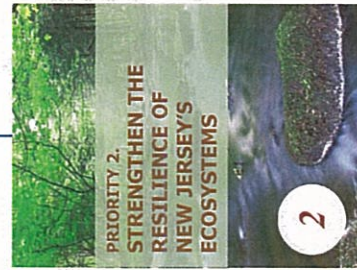


This inaugural edition of the strategy does not establish new policy; it identifies the areas for reform and new policy development.

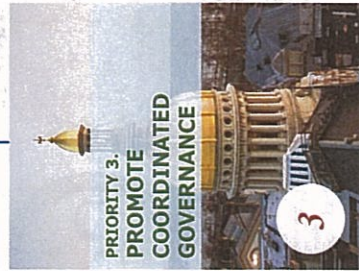
PRIORITIES



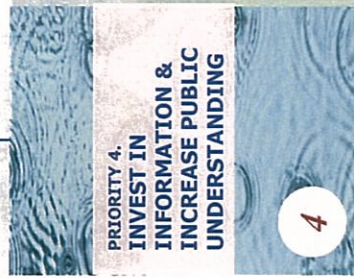
Build Resilient and Healthy Communities



Strengthen the Resilience of New Jersey's Ecosystems



Promote Coordinated Governance



Invest in information & increase public understanding



Promote climate-informed investments & innovative financing

The Murphy Administration is Not Waiting to Make Change While Developing the New Climate Resilience Playbook: Executive Order 100 (Jan. 2020) Ordered NJDEP to pursue the New Jersey Protecting Against Climate Threats (NJPACT) Regulatory Reforms

Guiding Principles of NJPACT

Protect people, communities, and assets from climate threats both today and tomorrow.

Ensure rules reflect current science and consider future conditions as informed by that science.

Balance emissions reductions and resilience needs with present and future economic demands.

Deploy flexible standards commensurate with risk recognizing that no one-size fits all

Encourage safe, sustainable, and resilient development that reduces emissions and climate risk.

Provide tools to assist residents, businesses, and public entities to make informed decisions.

Facilitate creation of lower-cost natural systems to manage environmental externalities.

Promote justice and equity by prioritizing pollutant reduction and adaptation in front line communities



25x

NJPACT: Resilient Environment And Landscapes (REAL) Reforms

To address the unavoidable impacts of climate change, such as sea-level rise, extreme weather, and chronic flooding, NJDEP is pursuing targeted regulatory reforms that will modernize the land use rules and focus on increased resiliency throughout the State.



Better protect against chronic inundation, sea-level rise, and flood damage



Protecting critical facilities and infrastructure



Increased protection of land and water resources



Address increases in stormwater



Incentivize planning for climate change



Encourage nature-based solutions



Support renewable energy deployment



Improve DEP permitting processes

