



FIGHTING CLIMATE CHANGE

WITH OFFSHORE WIND

Long Island, like coastal communities around the globe, is under threat due to climate change. Already there is a documented 2°F rise in global temperatures over the last 50 years, and the EPA estimates there will be a 4.5°F to 10°F increase by the 2080s¹. Climate experts are predicting that throughout this century, we are likely to experience longer and more extreme heat waves, degraded air quality, and a higher risk of heat related illness and death, particularly in urban areas like the NY tri-state area.



HOW CLIMATE CHANGE IMPACTS OUR COMMUNITIES

Sea Level Rise

As temperatures rise, thermal expansion in our oceans, coupled with the melting of glaciers and ice sheets, is causing sea level rise. Since 1880, scientists documented an 8-9 inch sea level rise². It is predicted that by 2050 sea level will rise an additional 8-30 inches, and by 2100 sea level will rise 18-50 inches. New York State predicts we could experience a 75 inch sea level rise³ if we do not ramp up efforts to fight climate change by making better energy, infrastructure, and land use decisions. Here on Long Island, the National Ocean and Atmospheric Administration (NOAA) predicts under its worst-case scenario a 6 ft sea level rise will cause most of the barrier islands and homes south of Merrick Road to be flooded or under water, with more than 150 municipalities impacted⁴.

Extreme Weather Events

Throughout the country, we are experiencing an increase of extreme weather events, with “100-year storms” becoming more regular occurrences. Since the 1950s, the northeast has documented a 70% increase in rainfall during heavy precipitation events, the highest in the nation⁵. NOAA predicts that in a worst-case scenario, the average high tide in NYC

will be 2 feet higher than the storm surge during Superstorm Sandy. In addition to the increase in extreme rain and snowfall, increasing summer temperatures also increase the likelihood of severe droughts, which threaten agriculture and irrigation, particularly in areas that rely on aquifers.



Ocean Acidification

Greenhouse gas emissions are not only causing increasing temperatures—they are also causing changing pH levels in our oceans and estuaries. Ocean acidity has increased 30% since the industrial revolution⁶, and marine scientists are documenting harmful impacts to our marine environment and economy. In 2014, a Canadian shell fishing company reported losing 10 million sea scallops and \$10 million from ocean acidification⁷. Ocean acidification will be an increasing problem throughout the northeast including adverse impacts to clams, oysters, and other shellfish, which are particularly vulnerable

LONG ISLAND AND CLIMATE CHANGE

to intense acidification. In the next 100-200 years, squid will take up to an extra 24 hours to hatch and spawn will be smaller, making the species increasingly more vulnerable to predators⁸. To protect our fish and shellfish species, we must work quickly to mitigate climate change impacts on our oceans and estuaries.



Source: Climate Central
https://xs.climatecentral.org/#12/40.6882/-73.6290?scenario=extreme_p50

Rising temperatures, extreme weather events, sea level rise, and ocean acidification will all pose an increasing threat to Long Island and our sustainability.

- Increasing water temperatures in Long Island Sound make our region inhospitable for cold water species, such as winter flounder and lobster, while warm water species make their way up to Long Island waters. Many invasive plants, including weeds like the mile-a-minute vine, kudzu⁹, and hydrillia¹⁰ are already disrupting native plants in Long Island ecosystems. The sea squirt and Asian shrimp, which are native to the warm waters of the Pacific,

have been found in Long Island Sound over the last two decades and now threaten Long Island's native shellfish¹¹.

- Sea level rise and increased flooding on the north and south shore worsens the impacts of storms on our coastline. Homes and infrastructure are being raised, including roads in Freeport, Lindenhurst, Smithtown, and Southampton, as well as the Shelter Island ferry, while residents in the most vulnerable communities are facing managed retreat and home buyouts.



- The New York City Panel on Climate Change estimates that rising sea temperatures over the last century increased the area flooded by Superstorm Sandy by 25 miles¹². The storm destroyed or damaged 95,000 buildings on Long Island and caused billions of dollars in damages¹³.

LONG ISLAND AND CLIMATE CHANGE

- In addition to severe flooding during rain and snow events, “sunny day” flooding, or flooding solely due to high tide and not precipitation, poses a real risk to south shore communities. Coastal communities across the US are already experiencing three times more high tide flood days than just 20 years ago, and the trend will only grow worse¹⁴. In Mastic Beach Village, which is experiencing some of the worst impacts of sea level rise, roads are frequently so severely flooded that residents often cannot cross the street or visit neighbors¹⁵.
- Long Island has experienced a shift in seasons. Warmer winters coupled with longer, hotter summers are creating more hospitable conditions for pests like the southern pine beetle, lone star tick, deer tick, and mosquitos, as well as pollen, ragweed, and poison ivy. While this means a longer agricultural growing season, it also means that pests that threaten local crops will grow larger, faster, and lay more eggs¹⁶, while more water will be required to irrigate farms.
- Suffolk County regularly receives an “F” for air quality from the American Lung Association¹⁷. Increasing temperatures, and in turn worsening air quality during summer heat waves, will cause further health risk from poor air quality for at-risk residents.
- Our best natural defense against flooding and climate change are our wetlands and sea grass, which soak up storm surges and protect coastal infrastructure. Both Nassau and Suffolk Counties have lost significant quantities of these natural buffers. Overdevelopment as well as nitrogen pollution from sewage and septic systems, which weakens sea grass's root system, play a role in the loss of these important habitats¹⁸.
- Climate change also plays a significant role in the loss of our wetlands. As wetlands experience sea level rise and saltwater intrusion, they begin migrating inland or become submerged in open water if they cannot migrate fast enough. Climate change poses a serious threat to our remaining wetlands, and our wetlands are crucial to combating the impacts of climate change¹⁹.
- Harmful algal blooms (HABS) plague nearly every waterway on Long Island,



Tidal Wetlands at Flax Pond in Old Field, NY
Source: DEC

from the western Long Island Sound to the Peconic Estuary. These HABs, the result of nitrogen pollution from sewage, cause fish die offs, beach closures, impaired waterways, and human health impacts. Unfortunately, climate change is likely to exacerbate our HAB problem, with cyanobacteria and algae blooms thriving in warmer waters, and the die off of algae leading to lower dissolved oxygen and higher CO2 levels in our waterways.^{20,21} HABs and low dissolved oxygen could also compound the loss of clam and scallop populations in our bays and estuaries due to ocean acidification²².

- Long Island relies on aquifers for 100% of our drinking water, which are already experiencing saltwater intrusion and contamination issues. Rising sea levels push saltwater into our aquifer system contaminating our fresh water supply.

If we are going to sustain our way of life on Long Island, we must do everything we can to fight climate change.

Transitioning to Renewable Energy

In 2019 New York State passed the strongest climate law in the nation—the

Climate Leadership and Community Protection Act (CLCPA). The CLCPA mandates NY achieve 70% renewable energy by 2030 and carbon-free electricity by 2040. Long Island will play a key role in the state's transition from fossil fuels to renewable energy. We cannot succeed in meeting these critical goals without offshore wind—the CLCPA mandates that NY procure 9,000MW of offshore wind by 2035. Furthermore, a recent study found that to meet the 2040 goal of carbon-free electricity, offshore wind capacity will need to grow to 25 gigawatts (GW); supplying 34% of New York load in 2040²³.

Long Island has three legacy fossil fuel power plants, located in Northport, Port Jefferson, and Island Park, which provide 40% of the island's generation capacity for electricity. Due to increased energy efficiency and renewable energy, including solar power, the need for these antiquated plants has greatly declined, but they still provide 22% of Long Island's energy²⁴. We also generate power from a combined cycle power plant in Yaphank, known as Caithness, as well as over 30 additional fossil fuel "peaker plants". Peaker plants are smaller fossil fuel power plants that were originally built to meet electricity needs during high demand, such as summer time²⁵. If we are going to fight climate change here on Long Island, we need to transition away from fossil fuels and embrace renewable energy, particularly offshore wind and solar.

Long Island's vast offshore wind potential will allow us to significantly reduce the



greenhouse gas emissions that contribute to climate change and to curb our reliance on polluting fossil fuels. A study of wind energy impacts in the eastern USA, conducted by the National Renewable Energy Laboratory, concluded that “Wind generation displaces carbon-based fuels, directly reducing carbon dioxide (CO₂) emissions. Emissions continue to decline as more wind is added to the supply picture.”²⁶ In fact, the first 2,400 megawatts (MW) of offshore wind energy developed to meet New York’s target would reduce greenhouse gas emissions in the state by more than 5 million tons each year, the equivalent of removing nearly one million cars from the road by 2030²⁷. By embracing offshore wind, Long Island can fight climate change and protect our communities.

Offshore Wind

Long Island is poised to be an offshore wind leader, with five proposed offshore wind farms that can generate over 4300 MW of power which can supply power for over 2 million homes.

- The South Fork Wind Farm off the coast of Montauk, will power 70,000 homes on the south fork of Long Island with renewable energy²⁸. Choosing this project was a major milestone, with Long Island having the choice between the state’s first offshore wind farm or a new fossil fuel power station located on the south fork. The public overwhelmingly supported

wind over fossil fuels, and the South Fork Wind Farm was selected in 2015. Construction is currently underway and the project is expected to be completed and delivering energy to Long Island homes in 2024.

In 2019, New York State awarded bids to two offshore farms that will provide a combined 1,700 MW of wind power to Long Island and New York City. These projects are due to be completed by 2024²⁹.

- The Sunrise Wind Farm will be located off the south shore of Long Island. This project will generate 924 MW of power for 600,000 homes³⁰.
- The Empire Wind Farm will be located approximately 20 miles off the coast of the Rockaways and generate approximately 800 MW of energy, which will also power 500,000 homes³¹.

In 2023, New York State selected 3 additional offshore wind farms as winners of the state’s third competitive offshore wind solicitation. These projects combined will power 2 million homes. Once online, they will reduce greenhouse gas emissions by 7 million metric tons annually and provide billions in health benefits by helping transitioning off fossil fuels.

- Attentive Energy, developed by TotalEnergies, Rise Light & Power, and Corio Generation, will generate 1,404 MW of renewable energy, enough to power 700,000+ homes. This project

will be 54 miles offshore in the NY Bight and will connect into Queens at the Ravenswood Generating Station. Ravenswood, a former fossil fuel plant, will be repurposed to renewable energy and provide significant health and air quality benefits for NYC residents.

- Community Offshore Wind, developed by RWE Offshore Renewables and National Grid Ventures, will be located 64 miles offshore in the New York Bight and will provide power to NYC through an interconnection at Con Edison's Brooklyn Clean Energy Hub. This project will generate 1,314 MW which can power more than 500,000 homes.
- Excelsior Wind, developed by Vineyard Offshore, will be located 23 miles offshore and bring renewable energy to Long Island via a cable connection to the East Garden City substation. This project will generate 1,314 MW and power 650,000+ homes. In addition, this project will help strengthen and expand Long Island's electricity grid, which needs significant upgrades.

The South Fork, Sunrise, Empire, Attentive, Community Offshore, and Excelsior Wind Farms will be the first in a series of offshore wind projects that will allow us to achieve 9,000 MW by 2035. New York State predicts these offshore wind farms will create 10,000 local jobs in manufacturing, installation, and operations. Each project is required to undergo an in-depth environmental review process, including opportunities for public comment³².

Next Steps

Supporting well-sited, environmentally responsible offshore wind farms is critical to mitigating the impacts of climate change and achieving a carbon-free power sector by 2040. If you would like to learn more about these offshore wind farms, find studies on the environmental impact of offshore wind development, or find out about upcoming opportunities for public input, that information has been compiled on NYSERDA's website at <https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind>.

Wind Works New York is a coalition of environmental, labor, faith-based and community groups. We are a growing force behind educating the Long Island community on the benefits of renewable energy, particularly offshore wind. This coalition formed in 2020 to support responsibly-sited offshore wind farms off the coast of Long Island and foster public engagement in the ongoing environmental and technical review processes for these critical projects. Wind Works New York believes that public understanding of offshore wind and support for individual wind farms is critical to meeting New York's climate change goals and transition our island away from fossil fuels. While some of our core coalition members have been at the forefront of the fight for offshore wind on Long Island for over a decade, many of our key members have mobilized in response to the current need for offshore wind projects that hold the promise of finally bringing clean, renewable wind energy to our communities. Please visit our website for more information at windworksny.org.



- 1 USGCRP. Horton, R., et al. *Ch. 16: Northeast Climate Change Impacts in the United States: The Third National Climate Assessment*, U.S. Global Change Research Program. 2014.
- 2 NOAA. <https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level>.
- 3 NYS DEC. Part 490, Projected Sea-Level Rise - Regulatory Impact Statement <https://www.dec.ny.gov/regulations/103889.html>.
- 4 NOAA. Sea Level Rise Viewer. <https://coast.noaa.gov/slr/#/layer/slr/6/8176295.033508885/4967741.913843484/11/satellite/124/0.8/2050/interHigh/midAccretion>.
- 5 National Climate Assessment. Heavy Downpours Increasing. <https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing>.
- 6 NOAA. Ocean Acidification. <https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-acidification>.
- 7 CBC. Acidic ocean deadly for Vancouver Island scallop industry. <https://www.cbc.ca/news/canada/british-columbia/acidic-ocean-deadly-for-vancouver-island-scallop-industry-1.2551662>. Feb 25, 2014.
- 8 Scientific American. Ocean Acidification Hurts Squid, Too. <https://www.scientificamerican.com/article/ocean-acidification-hurts-squid-too/>. June 13, 2013.
- 9 Cho, R. How Climate Change Affects New York's Plants and Animals. Earth Institute at Columbia University. <https://blogs.ei.columbia.edu/2017/01/06/how-climate-change-is-affecting-new-yorks-plants-and-animals/>
- 10 Smith, J. Invasive water plants make inroads on Long Island. *Newsday*. August 2009. <https://www.newsday.com/long-island/nassau/invasive-water-plants-make-inroads-on-long-island-1.1346057>
- 11 Benson, J. Two invasive species in Long Island Sound worry marine biologists. *The Day*. September 2011. <https://www.theday.com/article/20110914/NWS12/110919805>
- 12 New York Academy of Sciences. New York City Panel on Climate Change 2015 Report Chapter 2: Sea Level Rise and Coastal Storms. <https://nyaspubs.onlinelibrary.wiley.com/doi/full/10.1111/nyas.12593>. February 16, 2015.
- 13 Roy, Y. *Newsday*. Where LI stands five years after superstorm Sandy. <https://www.newsday.com/long-island/superstorm-sandy-five-years-later-1.14462179>. October 15, 2017.
- 14 NOAA. 2019 State of US High Tide Flooding with a 2020 Outlook. https://tidesandcurrents.noaa.gov/publications/Techrpt_092_2019_State_of_US_High_Tide_Flooding_with_a_2020_Outlook_30June2020.pdf
- 15 MacGowen, C. Mastic Beach Flooding Ruining Quality of Life, Residents Say. *Newsday*. January 2020. <https://www.newsday.com/long-island/suffolk/mastic-beach-flooding-1.40866058>
- 16 Cho, R. How Climate Change Affects New York's Plants and Animals. Earth Institute at Columbia University. <https://blogs.ei.columbia.edu/2017/01/06/how-climate-change-is-affecting-new-yorks-plants-and-animals/>
- 17 Ricks, D. *Newsday*. Suffolk again gets 'F' for air quality, report says. <https://www.newsday.com/long-island/suffolk/air-quality-ozone-suffolk-county-american-lung-association-1.18119864>. April 18, 2018.
- 18 Nitrogen Pollution and The Future of Long Island by Prof. Christopher Gobler. <https://www.slideshare.net/Savethegreatsouthbay/nitrogen-and-the-future-of-long-island-by-prof-christopher-gobler>.
- 19 EPA. Maryland Analyzes Coastal Wetlands Susceptibility to Climate Change. <https://www.epa.gov/arc-x/maryland-analyzes-coastal-wetlands-susceptibility-climate-change>.
- 20 Hans, P. et al. Blooms like it hot. *Science*. April 2008. <https://science.sciencemag.org/content/320/5872/57.full>
- 21 Gobler, C. et al. Ocean Warming Promotes Species-specific Increases in the Cellular Growth Rates of Harmful Algal Blooms. <https://www.pnas.org/content/114/46/E9765>
- 22 Gobler, C. et al. Hypoxia and Acidification Have Additive and Synergistic Negative Effects on the Growth, Survival, and Metamorphosis of Early Life Stage Bivalve. *PLOS ONE*. January 2014.
- 23 The Brattle Group Prepared for NYISO. May 18, 2020. "New York's Evolution to a Zero Emission Power System: Modeling Operations and Investment Through 2040". <https://www.nyiso.com/documents/20142/12610513/Brattle%20New%20York%20Electric%20Grid%20Evolution%20Study.pdf/6a93a215-9db3-d5a0-6543-27b664229d3e>
- 24 LIPA. 2018. Property Tax Reduction Efforts. Available at https://www.lipower.org/wp-content/uploads/2018/06/LIPA-Tax-Reduction-Efforts_6-5-FINAL-Web.pdf
- 25 NYS Public Service Commission. 2019. The Potential for Energy Storage to Repower or Replace Peaking Units in New York State. <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b4B623B91-CAF8-448C-BE98-6104F2861F98%7d>.
- 26 National Renewable Energy Laboratory, "Eastern Wind Integration And Transmission Study," 2011.
- 27 Jonathan J Buonocore, Patrick Luckow, Jeremy Fisher, Willett Kempton and Jonathan I Levy, 2016, "Health and climate benefits of offshore wind facilities in the Mid- Atlantic United States" *Environ. Res. Lett.* 11 (2016) 074019. doi:10.1088/1748-9326/11/7/074019
- 28 LIPA. South Fork Wind Farm Fact Sheet. https://www.lipower.org/wp-content/uploads/2019/10/LIPA-First-Offshore-Wind-Farm-DocV19_102819-FINAL.pdf.
- 29 NYS Energy Research and Development Authority. Governor Cuomo Announces Finalized Contracts for Empire Wind and Sunrise Wind Offshore Wind Projects to Deliver Nearly 1,700 Megawatts of Clean and Affordable Renewable Energy to New Yorkers. <https://www.nyserda.ny.gov/About/Newsroom/2019-Announcements/2019-10-23-GovernorCuomo-Announces-Finalized-Contracts-for-Empire-Windand-Sunrise-Wind-Offshore-Wind-Projects> October 2019.
- 30 Power Technology. Sunrise Wind Project, NY. <https://www.power-technology.com/projects/sunrise-wind-project-new-york/>.
- 31 Equinor offshore wind bid wins in New York State. <https://www.equinor.com/en/news/2019-new-york-offshore-wind-bid.html>. July 2019.
- 32 Governor Andrew M. Cuomo. Governor Cuomo Executes the Nation's Largest Offshore Wind Agreement and Signs Historic Climate Leadership and Community Protection Act. Available at <https://www.governor.ny.gov/news/governor-cuomo-executes-nations-largest-offshore-wind-agreement-and-signshistoric-climate>. July 2019.



Phone: (516) 390-7150

Email: farmingdale@citizenscampaign.org

www.citizenscampaign.org

225A Main Street Farmingdale, NY 11735