

Stopping Climate Change in New Jersey

100 percent renewable energy by 2035

Rising global temperatures risk irreversible worldwide ecological and climatic changes, with widespread impacts on human health and natural systems. The threats include more violent storms, droughts, floods, acidifying and rapidly warming oceans, and altered growing seasons.¹ Climate change has already strengthened storms like Superstorm Sandy that devastated New Jersey and the rest of the Northeast Atlantic seaboard.² We must rapidly transition away from dirty fossil fuels like coal, oil and natural gas to clean, renewable energy as soon as possible to prevent the worst effects of a warming planet.³ New Jersey must — and can — shift to 100 percent renewable energy by 2035.

The Urgent Need to Act Now on Climate

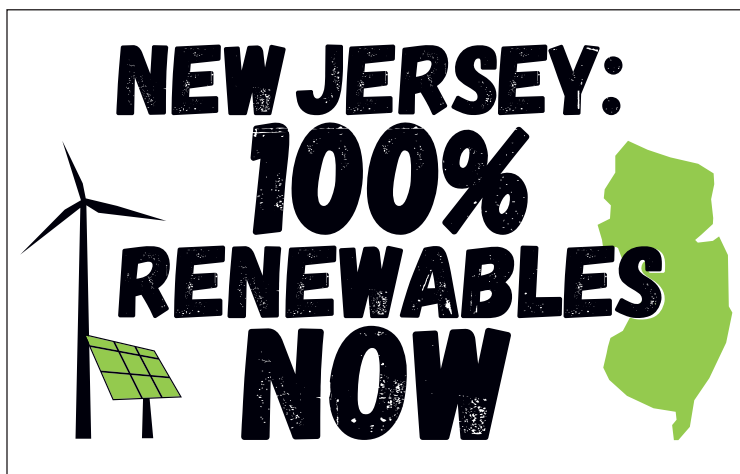
The warming of the planet is already causing significant damage that is expected to get worse. U.S. temperatures have increased dramatically over the past century, and this warming has only accelerated over the past few decades.⁴ Since 1970, average New Jersey temperatures have increased by about 0.56 degrees Fahrenheit (0.31 degrees Celsius) per decade.⁵ New Jersey's coastal sea levels have risen approximately one inch every six years and are predicted to be over two feet higher by 2050 due to climate change.⁶ Since 1970,

the state has experienced more-frequent extreme weather events, with more-intense precipitation and more droughts during warmer months.⁷

Climate change has likely exacerbated the impacts of severe weather events like Sandy.⁸ In New Jersey, Superstorm Sandy destroyed nearly 350,000 homes, caused \$11.7 billion in economic losses and killed 12 people.⁹ Researchers estimate that Atlantic City is one of the 25 most susceptible U.S. cities to coastal flooding, with 37,000 people living in at-risk areas.¹⁰ Populations such as lower-income people and people of color, who tend to live in coastal communities and areas most vulnerable to flooding, will be disproportionately affected.¹¹

Climate change impacts will be expensive. Rising sea levels and more storms will likely raise flood and homeowner insurance rates.¹² Hurricanes like Sandy, already one of the most expensive in U.S. history, are expected to cost New Jersey up to \$4 billion in additional damages per year by 2100 as a result of sea-level rise alone.¹³

Pollution, extreme heat days and disease transmission — and the associated public health risks — are expected to worsen as the planet warms.¹⁴ Vulnerable New Jersey



populations, such as people of color, the elderly and children, will be the most impacted.¹⁵ Increasing temperatures raise the risk of heat-related death for the elderly and lower-income households.¹⁶ Other threats include increased concentrations of ground-level ozone, a respiratory toxicant, and higher risk of insect-borne diseases like Lyme disease and West Nile virus.¹⁷

New Jersey's Electricity Mix Needs to Rapidly Shift to Clean, Renewable Energy

Currently, much of New Jersey's power comes from greenhouse gas-emitting fossil fuels. In 2016, natural gas-fired power plants delivered 56 percent of the state's electricity.¹⁸ Less than 3 percent of New Jersey's electricity came from clean renewables like wind, solar, tidal or geothermal energy.¹⁹

New Jersey's reliance on dirty fuel has caused the state to become a hub for natural gas pipelines, with around 1,500 miles of gas transportation pipelines in the state.²⁰ Despite the public outcry over the pipeline-building spree,²¹ New Jersey has approved an additional \$180 million for a natural gas pipeline that would cut through the environmentally sensitive Pinelands.²² The state's natural gas pipelines largely transport fracked natural gas from the Marcellus Shale region — increasing emissions of the potent greenhouse gas methane and delaying the shift to renewable energy.²³

New Jersey Must and Can Shift to Clean Renewables

New Jersey's continued reliance on fossil fuels — and promotion of natural gas pipelines — only perpetuates a dirty energy future that threatens our climate. The New Jersey Off Fossil Fuels Act (NJ OFF Act, S1405/A1823) is the strongest climate bill in history and charts a path for New Jersey to achieve 100 percent renewable energy by 2035.

The bill calls for a complete and rapid overhaul of the current energy system — a daunting task, but we can and we must do it. As President John F. Kennedy said about the Apollo mission to put a man on the moon, we do it “because that challenge is one that we are willing to accept, one that we are unwilling to postpone, and one which we intend to win.”



The NJ OFF Act is our best chance at tackling climate change, and the most necessary. It promotes a clean energy system based on wind, solar and other sources of genuinely renewable energy; on energy storage and on continued improvements in energy efficiency. We have no time to lose.

New Jersey's Untapped Reservoir of Clean Energy

New Jersey has made considerable progress transitioning to clean and efficient energy as one of the leading U.S. states in renewable power, but much more must be done.²⁴ In 2016, New Jersey ranked fifth in the nation for solar, with a capacity of 2,234 megawatts, enough to power nearly 350,000 homes and providing over 6,000 jobs.²⁵ From 2014 to 2016, New Jersey's solar capacity increased by 41 percent to become the state's leading source of renewable energy, providing over 74 percent of the renewable electricity generation in 2016.²⁶

This robust growth is only expected to continue as New Jersey realizes its immense solar capacity potential. New Jersey's rooftop solar alone can increase by 20 times from 2013 levels, which could meet over a third of the state's annual electricity consumption.²⁷ The Solar Energy Industries Association estimates that another 1,198 megawatts will be added over the next five years, nearly doubling the current capacity and powering about 200,000 homes.²⁸

Unlike solar, New Jersey wind energy barely increased at all over the past few years; with only 9 megawatts of installed wind power, the state ranks 38th in the nation, a

lag due largely to political inertia.²⁹ As a result, New Jersey has significant amounts of onshore and offshore wind energy potential that are yet to be captured.³⁰

While New Jersey was the first state to establish a specific mandate for offshore wind in 2010 (with a requirement of at least 1,100 megawatts) and Governor Phil Murphy signed an executive order in January 2018 that pushed for 3,500 megawatts of offshore wind by 2030, there is no offshore wind to date.³¹ Two companies, US Wind and DONG Energy, currently hold leases for offshore wind that has not been developed; together, these projects could add 4,150 megawatts of wind power.³²

Emerging and improving battery storage technology is already being deployed to integrate these renewable power resources into a reliable and resilient electricity system.³³

Some estimates suggest that current and emerging renewable technologies could provide a significant share of New Jersey's electricity requirements.³⁴ Renewables are already being deployed at unprecedented rates, exceeding expectations many times over.³⁵ A more rapid shift to genuine renewables under the NJ OFF Act would supercharge this shift.

Benefits of Clean and Efficient Power

These changes will protect the planet and strengthen the economy. Increased solar and wind energy substantially reduce greenhouse gas emissions, lower overall energy

costs and improve electric power grid reliability.³⁶ A transition to clean energy could also mean a better New Jersey economy, with the creation of thousands of new jobs. Solar energy jobs have more than doubled in New Jersey between 2011 and 2016.³⁷ New Jersey's Atlantic seashore is suitable for large-scale offshore wind installations that could significantly boost wind jobs and the local economy.³⁸

Energy efficiency is another key component to reducing consumption and dependence on dirty fuels and is an incredibly cost-effective way to reduce greenhouse gas emissions and toxic pollutants.³⁹ New Jersey ranks in the middle of the pack for energy savings potential, but even the current energy efficiency sector employs more than 31,000 workers.⁴⁰ Cost-effective improvements in energy efficiency can result in 26 percent in energy savings for New Jersey families, as well as a \$1.5 billion annual reduction in utility bills.⁴¹

Take Action

The NJ OFF Act charts the strongest path to tackle climate change by pushing for a 100 percent clean energy economy. New Jersey has the potential to achieve this transition and reap the substantial economic benefits. Tell your members of the New Jersey legislature to support the NJ OFF Act today: fwwat.ch/NJ100NOW

Endnotes

- 1 Pachauri, Rajendra K. et al. "Climate Change 2014: Synthesis Report Summary for Policymakers." Intergovernmental Panel on Climate Change. 2015 at 2; Pachauri, Rajendra K. et al. "Climate Change 2014: Synthesis Report." IPCC. 2015 at 40 to 41, 49 to 53, 60, 67 and 69.
- 2 Trenberth, Kevin E., John T. Fasullo and Theodore G. Shepherd. "Attribution of climate extreme events." *Nature Climate Change*. Vol. 5. August 2015 at 725 and 727.
- 3 United Nations Framework Convention on Climate Change. "Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015." Part two: Action taken by the Conference of the Parties at its twenty-first session. January 29, 2016 at 22.
- 4 Tebaldi, Claudia, Dennis Adams-Smith and Nicole Heller. Climate Central. "The Heat Is On: U.S. Temperature Trends." June 2012 at Table 1 and Table 2.
- 5 Tebaldi et al. (2012) at Table 2.
- 6 U.S. Environmental Protection Agency (EPA). "What Climate Change Means for New Jersey." EPA 430-F-16-032. August 2016 at 1; Rutgers University. New Jersey Climate Adaptation Alliance (NJCAA). "A Summary of Climate Change Impacts and Preparedness Opportunities for the Coastal Communities in New Jersey." April 2014 at 3 and 4.
- 7 New Jersey Department of Environmental Protection (DEP). Division of Science, Research, and Environmental Health. "Climate Change in New Jersey: Temperature, Precipitation, Extreme Events and Sea Level." Environmental Trends Report. Updated August 2017 at 1.
- 8 Trenberth et al. (2015) at 727.
- 9 DEP. Office of Science. "Damage Assessment Report on the Effects of Hurricane Sandy on the State of New Jersey's Natural Resources." May 2015 at 1; Rutgers University (2014) at 5; Blake, Eric S. et al. National Hurricane Center. Tropical Cyclone Report: Hurricane Sandy (AL182012) 22 – 29 October 2012. February 12, 2013 at 120.
- 10 Climate Central. "These U.S. Cities Are Most Vulnerable to Major Coastal Flooding and Sea Level Rise." October 25, 2017.
- 11 Sheats, Nicky. New Jersey Climate Alliance. Prepared for the NJCAA. "Stakeholder Engagement Report: Environmental Justice." Climate Change Preparedness in New Jersey. June 2014 at 7; Climate Central (2017); Pflücke, Kelly M. et al. Rutgers University. "Populations Vulnerable to Climate Change in New Jersey: Update of a Statistical Analysis." June 2015 at 3 to 4 and 10.
- 12 EPA (2016) at 1.

- 13 Rhodium Group. "American Climate Prospectus: Economic Risks in the United States." October 2014 at 94; National Centers for Environmental Information. National Oceanic and Atmospheric Administration. "Billion-Dollar Weather and Climate Disasters: Table of Events." 2017. Available at <https://www.ncdc.noaa.gov/billions/events/US/1980-2017>. Accessed November 2017.
- 14 EPA (2016) at 2; Smith, K. R. et al. "Human health: impacts, adaptation, and co-benefits." *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. 2014 at 713.
- 15 Smith (2014) at 717 to 718, 734 and 742; Sheats (2014) at 10.
- 16 Moran, D. et al. NJCAA. "New Jersey Climate and Health Profile Report." February 2017 at 16 and 33.
- 17 *Ibid.* at 41 to 42; EPA (2016) at 2.
- 18 Food & Water Watch analysis of U.S. Energy Information Administration (EIA) data. "Net generation for electric power, New Jersey." 2017. Available at <https://www.eia.gov/electricity/data/browser/>. Accessed October 2017.
- 19 *Ibid.*
- 20 State of New Jersey. "2011 New Jersey Energy Master Plan." December 6, 2011 at 57.
- 21 Brown, Keith. "Pipeline protesters decry Pinelands intrusion at statehouse rally." March 16, 2016.
- 22 Sol Warren, Michael. "Controversial \$180M pipeline clears last major hurdle in Pinelands vote." September 14, 2017.
- 23 State of New Jersey (2011) at 58; Food & Water Watch. "The Urgent Case for a Ban on Fracking." February 2015 at 18; Zhang, Xiaochun et al. "Climate benefits of natural gas as a bridge fuel and potential delay of near-zero energy systems." *Applied Energy*. 2015 at 1 and 5.
- 24 Solar Power Rocks. "2017 United States Solar Power Rankings." 2017; Solar Energy Industries Association (SEIA). "Solar Spotlight - New Jersey." Updated December 14, 2017; New Jersey Board of Public Utilities and DEP. "New Jersey Energy Master Plan - Update." December 2015 at 14.
- 25 SEIA (2017); Meister Consultants Group. Prepared for the Rutgers Center for Energy, Economic and Environmental Policy. "Solar Development Volatility in New Jersey." March 2014 at 10.
- 26 Food & Water Watch analysis of New Jersey Clean Energy Program data for "New Jersey Solar Installations Annually as of 10/31/17." October 2017. Available at <http://njcleanenergy.com/renewable-energy/project-activity-reports/solar-activity-report-archive>. Accessed January 2018; Food & Water Watch analysis of EIA data. "Net generation for all sectors, New Jersey." 2017. Available at <https://www.eia.gov/electricity/data/browser/>. Accessed January 2018; EIA. "New Jersey State Energy Profile." July 20, 2017 at 1 and 9.
- 27 Kurdgelashvili, Lado et al. "Estimating technical potential for rooftop photovoltaics in California, Arizona and New Jersey." *Renewable Energy*. 2016 at 301.
- 28 SEIA (2017).
- 29 American Wind Energy Association. "U.S. Wind Industry Third Quarter 2017 Market Report." October 25, 2017 at 6; Ryan, Joe. "Developers Plan Wind Farms Off Jersey as Christie Era Ends." Bloomberg. October 24, 2017.
- 30 Navigant Consulting. Prepared for Rutgers University and the New Jersey Board of Public Utilities. "Market Assessment Services to Characterize the Opportunities for Renewable Energy - Final Report." August 6, 2012 at 5; U.S. Department of Energy (DOE). Office of Energy Efficiency and Renewable Energy. "2016 Offshore Wind Technologies Market Report." August 2017 at 43.
- 31 Office of the Governor. "Governor Christie Signs Offshore Wind Economic Development Act to Spur Economic Growth, Encourage Energy as Industry." August 19, 2010; EIA (July 20, 2017) at 9; State of New Jersey. [Press release]. "Governor Murphy signs executive order to promote offshore wind energy." January 31, 2018.
- 32 DOE (2017) at 43.
- 33 Johnson, Tim. "State Invests in Backup Storage for Solar Power and Wind Energy Systems." *NJ Spotlight*. March 24, 2015; PJM. "New Services Queue - Beta." Available at <https://www.pjm.com/planning/services-requests/interconnection-queues.aspx>. Accessed December 2017.
- 34 Kurdgelashvili et al. (2016) at 301.
- 35 Natural Resources Defense Council. "NRDC's Fifth Annual Energy Report: America's Clean Energy Revolution." October 2017 at 12.
- 36 Siler-Evans, Kyle et al. "Regional variations in the health, environmental, and climate benefits of wind and solar generation." *Proceedings of the National Academy of Sciences (PNAS)*. Vol. 110, No. 29. 2013 at 11768 and 11769; Bloomberg New Energy Finance. "Sustainable Energy in America Factbook." 2017 at 1; Ela, Erik et al. National Renewable Energy Laboratory (NREL). "Active Power Controls From Wind Power: Bridging the Gaps." January 2014 at xi; NREL. "Distributed Solar PV for Electricity System Resiliency: Policy and Regulatory Considerations." NREL/BR-6A20-62631. November 2014 at 1; Farrell, John. Institute for Local Self-Reliance. "Rooftop Revolution: Changing Everything With Cost-Effective Local Solar." March 2012 at 16; Acadia Center. "Value of Distributed Generation: Solar PV in Massachusetts." April 2015 at 1 to 2; World Economic Forum. "Renewable Infrastructure Investment Handbook: A Guide for Institutional Investors." December 2016 at 4 and 6.
- 37 The Solar Foundation. "National Solar Jobs Census 2011." October 2011 at 61; The Solar Foundation. "National Solar Jobs Census 2016." February 2017 at Appendix A.
- 38 DOE. "2017 U.S. energy and jobs report state charts." 2017 at PDF 183; Johnson, Tom. "New Jersey could still be a powerful player in offshore wind industry." *NJ Spotlight*. March 30, 2016; "New Jersey and wind power: perfect together?" *Associated Press*. January 4, 2016.
- 39 Schwartz, Lisa et al. DOE. Office of Energy Efficiency and Renewable Energy. The State and Local Energy Efficiency Action Network. "SEE action guide for states: energy efficiency as a least-cost strategy to reduce greenhouse gases and air pollution and meet energy needs in the power sector." February 2016 at 2.
- 40 DOE (2017) at 182; Berg, Weston et al. American Council for an Energy-Efficient Economy. "The 2017 state energy efficiency scorecard." September 2017 at 8 and 9.
- 41 NREL. "Residential Energy Efficiency Potential - New Jersey." November 2017 at 1.