



## WHAT DOES CLIMATE CHANGE MEAN FOR PENNSYLVANIA?

### Climate Change and the Northeast

- According to the United States National Climate Assessment, temperatures increased by 2° F between 1895 and 2011 in the Northeastern U.S.<sup>i</sup> (higher than the national average of 1.5° F for the same period<sup>ii</sup>).
- Also from 1895-2011, precipitation increased more than 10 percent (about 5 inches) in the Northeast.<sup>iii</sup>
- Coastal flooding from sea level rise has increased by roughly one foot since 1900, which exceeds the global average of about eight inches.<sup>iv</sup>

### Pennsylvania - Observed Climate Change Impacts

- In 2011, Pennsylvania broke 45 heat records, 57 rainfall records, and 49 snowfall records.<sup>v</sup>
- There are now 20 days every year over 90° F in major cities like Philadelphia and Harrisburg. Nearly one million Pennsylvanians live where summertime temperature records were set in 2010.<sup>vi</sup>
- Rising temperatures have contributed to the spread of dangerous vector-borne diseases in the state: over 51,000 reports of Lyme disease were observed from 1990-2008<sup>vii</sup> and 405 cases of West Nile virus from 1999-2010<sup>viii</sup>, where there were none prior.<sup>ix</sup>

### Pennsylvania - Projected Climate Change Impacts

- In the coming decades, precipitation in Pennsylvania is projected to increase between 5 and 12 percent.<sup>x</sup>
- Many areas of Pennsylvania could experience an additional nine or more days, and in a few spots 12 or more days, over 95° F per year for the period 2041-2070 with continued global emissions, in addition to the increase in 95° F days from 1971-2000.<sup>xi</sup>
- Rising temperatures will subject about 42 percent of counties in Pennsylvania to higher risk of water shortages by mid-century.<sup>xii</sup>

### What Has Pennsylvania Started Doing About It?

#### *State Actions Toward Emissions Reductions*

- Pennsylvania is one of 29 states that together with the District of Columbia have a renewable portfolio standard (RPS) policy mandating that a certain percentage of the state's electricity come from clean energy sources.<sup>xiii</sup>
- Under the RPS, investor-owned utilities (IOUs) and retail electric suppliers in the state are required to obtain roughly 18 percent of their electricity sales from alternative energy sources by 2021. However, the standard does not solely support the use of renewable technologies, as the state allows non-renewable technologies such as waste coal and coal-mine methane to count toward this standard. This results in a standard ultimately requiring only eight percent of electricity from renewable energy sources.<sup>xiv</sup>
- Pennsylvania ranks third in the U.S. in terms of energy-related carbon pollution.<sup>xv</sup> In 2008, the state passed the Pennsylvania Climate Change Act to address climate change and the state's greenhouse gas emissions by requiring the state to prepare a Climate Change Action Plan. In 2009, Pennsylvania released its first plan, which set a greenhouse gas reduction target of 30 percent below 2000 emissions by 2020.<sup>xvi</sup> However, at the end of 2013, the state backtracked when it released an updated plan with no emissions reduction target.<sup>xvii</sup>

#### *Renewable Energy in the State*

- Between 2005 and 2013, renewable energy has gone from providing 2.1 percent of the state's electricity to nearly 3.7 percent. During the same timeframe, electricity from biomass and hydropower accounted for a fairly constant two percent of the state's generation.<sup>xviii</sup>
- Wind energy has grown from 0.1 percent to nearly 1.5 percent of Pennsylvania's electricity generation, contributing to nearly all of the state's growth in renewable electricity generation.<sup>xix</sup>

#### *Wind Power*

- At the end of 2013, there were more than 1,300 megawatts (MW) of wind capacity installed across 27 wind farms in the state. That's enough to power more than 350,000 average Pennsylvanian homes.<sup>xx</sup>

- Unlike electricity generated from coal or natural gas, wind farms use almost no water to generate electricity *and* emit almost no carbon dioxide emissions. Over the course of a year, wind farms in Pennsylvania save more than 730 million gallons of water from being used to generate electricity, and the carbon pollution avoided is equal to taking nearly 350,000 cars off the road.<sup>xxi</sup>

### Solar Power

- In 2013, solar power accounted for a fraction of Pennsylvania’s electricity generation. However, if the state takes full advantage of its solar potential, it could generate 2.8 times its annual electricity needs.<sup>xxii</sup>

### Energy Efficiency

- In 2008, Pennsylvania established an Energy Efficiency Resource Standard that set various energy reduction goals for investor-owned utilities with more than 100,000 customers.<sup>xxiii</sup> This standard encouraged the affected utilities to expand their energy efficiency programs.<sup>xxiv</sup>

<sup>i</sup> National Climate Assessment Development Advisory Committee, United States Global Change Research Program, *National Climate Assessment – Draft for Public Review*, Chapter 16 – Northeast (January 2013), page 551.

<http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap16-northeast.pdf>

<sup>ii</sup> National Climate Assessment Development Advisory Committee, United States Global Change Research Program, *National Climate Assessment – Draft for Public Review*, Chapter 2 – Our Changing Climate (January 2013), page 35.

<http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap2-climate.pdf>

<sup>iii</sup> National Climate Assessment Development Advisory Committee, United States Global Change Research Program, *National Climate Assessment – Draft for Public Review*, Chapter 16 – Northeast (January 2013), page 551.

<http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap16-northeast.pdf>

<sup>iv</sup> Ibid.

<sup>v</sup> National Resource Defense Council, “Climate Change Health Threats in Pennsylvania,” last accessed April 23, 2014.

<http://www.nrdc.org/health/climate/pa.asp>

<sup>vi</sup> Ibid.

<sup>vii</sup> Ibid.

<sup>viii</sup> National Resource Defense Council, “Climate Change Health Threats in Pennsylvania,” last accessed April 23, 2014.

<http://www.nrdc.org/health/climate/pa.asp>

<sup>ix</sup> Pennsylvania’s West Nile Virus Control Program, “Pennsylvania West Nile Control Program 2000 Year End Report,” last accessed April 25, 2014. <http://www.westnile.state.pa.us/surv/2000report.htm>

<sup>x</sup> National Resource Defense Council, “Climate Change Health Threats in Pennsylvania,” last accessed April 23, 2014.

<http://www.nrdc.org/health/climate/pa.asp>

<sup>xi</sup> National Climate Assessment Development Advisory Committee, United States Global Change Research Program, *National Climate Assessment – Draft for Public Review*, Chapter 16 – Northeast (January 2013), page 552.

<http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap16-northeast.pdf>

<sup>xii</sup> National Resource Defense Council, “Climate Change Health Threats in Pennsylvania,” last accessed April 23, 2014.

<http://www.nrdc.org/health/climate/pa.asp>

<sup>xiii</sup> Database of State Incentives for Renewables & Efficiency, “RPS Policies,” last updated March 2013.

[http://www.dsireusa.org/documents/summarymaps/RPS\\_map.pdf](http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf)

<sup>xiv</sup> Database of State Incentives for Renewables & Efficiency, “Pennsylvania—Alternative Energy Portfolio Standard,” last updated August 9, 2012. [http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=PA06R&re=0&ee=0](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=PA06R&re=0&ee=0)

<sup>xv</sup> U.S. Energy Information Administration, “State-Level Energy-Related Carbon Dioxide Emissions, 2000-2010,” May 13, 2013.

<http://www.eia.gov/environment/emissions/state/analysis/>

<sup>xvi</sup> Pennsylvania Department of Environmental Protection, *Pennsylvania: Final Climate Change Action Plan* (December 18, 2009).

<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77736/ALL%20OF%20VOLUME%201%20AND%202.pdf>

<sup>xvii</sup> Pennsylvania Department of Environmental Protection, *Pennsylvania Climate Change Action Plan Update* (December 2013).

<http://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/Final%20Climate%20Change%20Action%20Plan%20Update.pdf>

<sup>xviii</sup> U.S. Energy Information Administration, “Electricity Data Browser,” last accessed April 22, 2014.

<http://www.eia.gov/electricity/data/browser/>

<sup>xix</sup> Ibid.

<sup>xx</sup> Pennsylvania Department of Environmental Protection, “Wind Power,” last accessed April 22, 2014.

[http://www.portal.state.pa.us/portal/server.pt/community/pa\\_energy/10407](http://www.portal.state.pa.us/portal/server.pt/community/pa_energy/10407)

<sup>xxi</sup> American Wind Energy Association, “State Wind Energy Statistics: Pennsylvania,” April 10, 2014.

<http://www.awea.org/Resources/state.aspx?ItemNumber=5188>

<sup>xxii</sup> National Renewable Energy Laboratory, *United States Renewable Energy Technical Potential*, last updated October 17, 2013.

[http://www.nrel.gov/gis/docs/us\\_re\\_technical\\_potential.xlsx](http://www.nrel.gov/gis/docs/us_re_technical_potential.xlsx)

<sup>xxiii</sup> Database of State Incentives for Renewables & Efficiency, “Pennsylvania—Energy Efficiency and Conservation Requirements for Utilities,” last updated December 13, 2012. [http://www.dsireusa.org/incentives/incentive.cfm?Incentive\\_Code=PA14R&re=0&ee=0](http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=PA14R&re=0&ee=0)

<sup>xxiv</sup> American Council for an Energy-Efficient Economy, “State Energy Efficiency Policy Database—Pennsylvania Utility Policies,” last updated August 21, 2013. <http://aceee.org/sector/state-policy/pennsylvania>