



**PUBLIC HEALTH INSTITUTE
OF WESTERN MASSACHUSETTS**
PARTNERS FOR HEALTH EQUITY

**Testimony for DOER Hearing on
225 CMR 14--Renewable Energy Portfolio Standard – Class I (“RPS Class I”) and
225 CMR 15--Renewable Energy Portfolio Standard – Class II (“RPS Class II”)
June 5, 2019**

The Public Health Institute of Western Massachusetts was formed over 20 years ago with the goal of building measurably healthier communities using data and its convening power to create collaborative partnerships. We convene the Pioneer Valley Asthma Coalition, a community partnership of healthcare organizations, local public health agencies, housing organizations, community agencies, academic institutions, community members, and other community based organizations that work to improve the quality of life for individuals, families and communities affected by asthma.

Once again, we are here to testify against biomass incinerators, which have a negative impact on air quality and health, particularly when located in environmental justice communities like Springfield.

It has been proven time and time again that air pollutant emissions from biomass facilities contribute to the extremely high rates of asthma and respiratory illness in nearby communities. The high concentration of particulate matter released from these facilities are gravely concerning for the health of children, older adults and all people with asthma in Springfield and the Pioneer Valley. The increased air pollution from the proposed RPS regulations around biomass energy has the potential to impact MA residents and in particular Springfield and Holyoke residents who are already experiencing significant health disparities. We oppose any incentives for biomass energy and urge the DOER to consider alternative energy that does not have the negative health impacts found with biomass.

Air Pollution Impact on Health

Air pollution is a major health danger for children and adults. Ozone, PM_{2.5} and outdoor air pollution have been shown to lead to morbidity for several chronic diseases including asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease, with recent studies also suggesting an association with diabetes (Anderson 2012, Brook 2004, Ko 2009, Rajagopalan 2012). In addition, air pollution affects the development of lungs and is linked to low birth weight and pre-term birth and susceptibility to infections. Air pollution is linked to neuroinflammation including stroke, Alzheimers and Parkinson’s diseases (Block 2009).

According to the EPA, fine particle pollution causes early death (both short-term and long-term exposure) and may cause reproductive and developmental harm (U.S. Environmental Protection Agency, *Integrated Science Assessment for Particulate Matter*, December 2009 EPA 600/R-08/139F). In 2013 the World Health Organization concluded that outdoor air pollution is carcinogenic to humans (<http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/news/news/2013/10/outdoor-air-pollution-a-leading-environmental-cause-of-cancer-deaths>)

Springfield in particular experiences poor ambient air quality due to development, zoning, and land use decisions which have located multiple mobile and point sources including a large inter-state highway, several state highways, and railroad lines running through the city and directly through its neighborhoods. Additionally, many cities in Hampden County are in a valley into which air pollution travels from other sources and settles.

Health Effects Specifically Related to Biomass

Even though burning wood for fuel is a time-honored tradition, increasingly there is a consensus around the negative health impacts of incineration. The key pollutants from biomass or wood incineration systems are: particulate matter, carbon monoxide, polycyclic aromatic hydrocarbons (PAHs), and heavy metal from contamination or treatment of wood. Fine particulate (pm 2.5) have the greatest risk though all particulates can have a systemic impact. (Hoppins & Jacobs, *Emissions and Health Effects of Wood Biomass Combustion*, 2013). Both ultrafine and PM 2.5 particles tend to deposit in the deep lung (alveolar regions), where they penetrate the blood stream and can have systemic biological effects. (Hoppins & Jacobs).

- Woodsmoke may be more harmful than other sources of air pollution. Woodsmoke results in a greater risk for respiratory problems than other kinds of emissions (ie traffic). There is also some evidence that woodsmoke leads to increased cardiovascular problems and there is already a demonstrated link between particulate pollution and cardiovascular outcomes. (Hoppin & Jacobs) As noted above, cancer risk is also a concern since woodsmoke can contain a number of carcinogens naturally occurring in wood as well as the risk of contamination or use of treated wood.
- Woodsmoke in specific has been shown to have harmful health impacts including “increased health care utilization to address respiratory illnesses, aggravation of asthma, aggravation of chronic obstructive pulmonary disease, bronchitis, and decreased lung function (Naeher et al. 2007; Boman et al. 2003)” (Hoppins & Jacobs, 187).
- Supporting biomass incineration could have both outdoor and indoor air quality impacts since fine particulate pollution can easily enter homes, schools and other

buildings. PM 2.5 from wood biomass combustion can remain suspended in ambient air for longer periods of time, can be transported over long distances, and can penetrate more readily into indoor environments as compared to larger, coarser particles (Wilson and Suh 1997). Consequently, fine particulate emissions into the outdoor ambient air from institutional, commercial, industrial, and electricity-generating wood biomass facilities can potentially pose an indoor as well as outdoor air quality hazard (Allen et al. 2003 ;Larson et al. 2004). (Hoppins & Jacobs)

Cancer Risk

Cancer is also a health outcome of concern, given the known carcinogens in woodsmoke. There is a risk of contamination from heavy metals that occur naturally in wood: Trace levels of heavy metals such as arsenic, cadmium, and nickel are generally found in the air emissions of wood-fired combustion units because the metals occur naturally in many types of wood (Washington State Department of Ecology 2003 ; Demirbas 2008). Metal emissions can be highly variable depending on the type of wood or biomass being burned, whether the fuel includes bark, whether the fuel is contaminated with other debris, and whether other fuel sources are used in combination with wood (Demirbas 2008 ; Chandrasekaran et al. 2012). While metals are not a significant fraction of particulate pollution, one recent study of emissions from institutional and commercial wood biomass combustion units (2.8–16.4 MW) found that heavy metals and trace elements, which occur naturally in wood fuel, showed a tendency to concentrate in fine particles (Sippula et al. 2009). (Hoppins & Jacobs)

Particulate Pollution at Any Level Results in Health Problems

The EPA strengthened its standards for pm 2.5 in 2013. In part the improvement in outdoor particulate pollution is due to these new standards which have lowered particulate pollution as well as the closing of the Mt Tom power plant and the switch of some local power plants from coal to natural gas fuel. Even though these decreases are significant, they are not enough. Studies have not found a “no-risk” level for particulates: the US EPA lowered the annual PM2.5 standard to in 2013, but studies have observed premature mortality at much lower levels (Crouse et al. 2012 ;Krewski et al. 2009). Numerous epidemiological studies examining the relationship between increase in PM 2.5 pollution and the most serious adverse health outcomes such as premature death or hospitalizations associated with heart or pulmonary conditions have not been able to identify a level of “no risk” (i.e., a no-threshold model) (Pope and Dockery 2006 ; Brook et al. 2010). **This implies that health protection is expected to improve with reductions in air pollution at any level.** (Hoppins & Jacobs, emphasis added).

Potential Exacerbation of Existing Health Disparities

Springfield is already burdened with a high level of health disparities. Biomass incineration has the potential to negatively impact residents who already suffer poor health outcomes. Chronic illness, such as preexisting respiratory disease, puts people at greater risk of adverse outcomes associated with exposure to fine particulate exposure. In addition, some populations are more susceptible to health effects because of their age or condition. For example, pregnant women, infants, children, the elderly, and individuals already burdened by significant environmental, social and economic stressors are more likely to be adversely affected by exposure to air pollution (Hoppin & Jacobs).

The following data show how Springfield residents already experience large health disparities when compared to the state. Residents are disproportionately impacted by high rates of asthma, stroke, chronic obstructive pulmonary disease (COPD), and cardiovascular disease.

Asthma

Springfield and Hampden County have been named the Asthma Capital of the US, the most challenging place for asthma, for the second year in a row by the Asthma and Allergy Foundation of America. The rankings are based on prevalence of asthma, emergency room visits, mortality, and presence of risk factors. Hampden County emergency room visit rates for asthma are 78% higher than statewide rates and rates are highest among Springfield and Holyoke residents (MDPH, Case Mix Data, 2014). Children in Hampden County go to the Emergency Room at 80% higher rates than the state (1,548 vs. 857)(MDPH,2014). Latinos in Hampden County experience large asthma-related disparities, with hospitalization rates 6 times that of Whites in Hampden County and more than 4 times that of the state hospitalization rate overall. Latino/a and Black Springfield residents continued to be at substantially greater risk of experiencing complications from asthma than White Springfield residents. Latino/a residents visited the emergency room for asthma-related complications at a rate nearly five times that of White Springfield residents, while Black residents had rates double that of Whites. Children age 0-14 also experienced these inequities with the highest rates among Latino/a children with rates double those of Whites (2,837 vs 1,107 per 100,000).

Childhood asthma prevalence is between 17- 20% in the urban cities of Springfield, Holyoke and Chicopee compared to 12% statewide and 8.4% nationwide (MDPH 2016-2017, CDC). About 1 in 4 older adults in Hampden County cities have asthma.

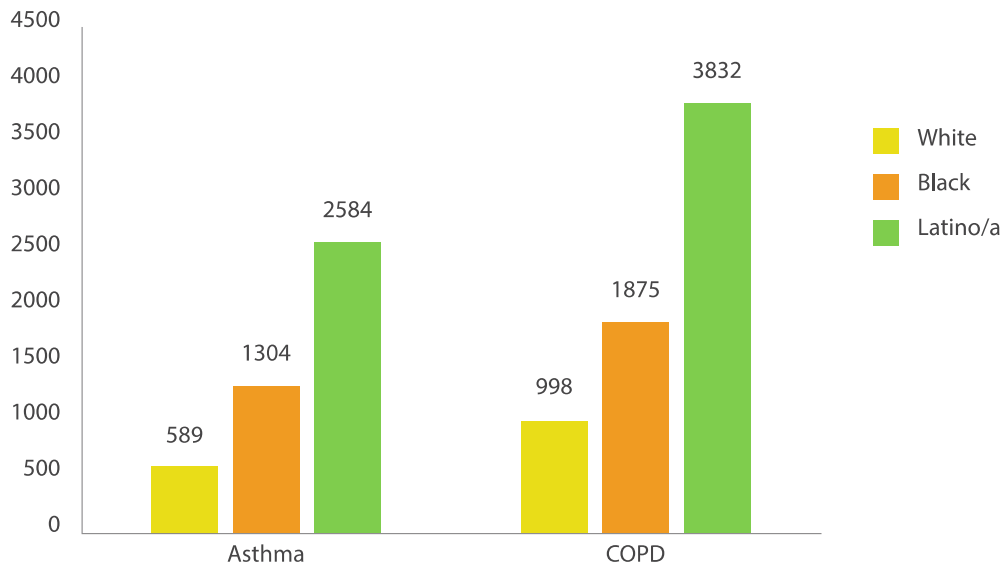


Figure 10. Springfield Asthma and COPD Emergency Room Visit Rates, 2012 – 2015
Source: MDPH, Acute Care Dataset; age-adjusted rates per 100,000

Chronic Obstructive Pulmonary Disease (COPD)

People of color in Springfield also continue to be at higher risk of COPD-related hospital visits. Latino/a residents were admitted to the ER at a rate almost 4 times greater than White residents and Blacks at a rate of almost two times that of Whites.

Cardiovascular Disease

Springfield residents experienced higher rates of cardiovascular disease hospitalization compared to the state as a whole from 2012-2015 (1,672 vs. 1,248 per 100,000)(MDPH Acute Care Dataset, 2012-2015). People of color in Springfield were at disproportionate risk of being admitted to the hospital for cardiovascular disease. Latino/a Springfield residents were admitted at a rate 70% greater than that of White residents, while Black Springfield residents were admitted at a rate 40% greater than that of Whites.

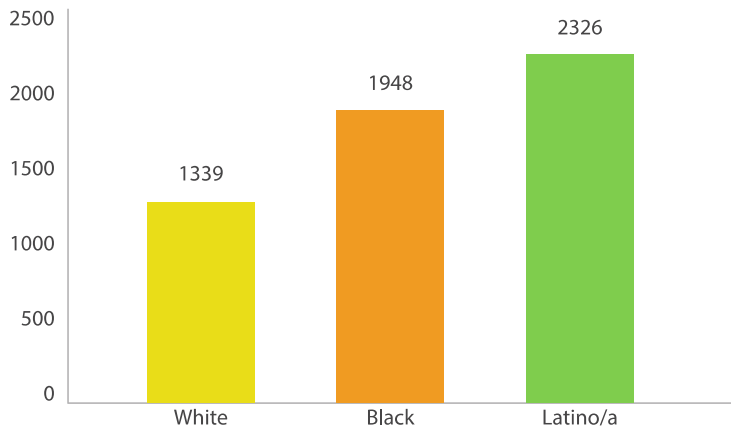


Figure 11. Springfield Cardiovascular Disease-Related Hospitalization Rates by Race/Ethnicity, 2012 – 2015
Source: MDPH, Acute Care Dataset; age-adjusted rates per 100,000

Based on these disparities, communities of color face even greater risk from the addition of pollution from the incentives for biomass energy.

Biomass and Climate Change Health Impacts

In addition to the direct results of air pollution, the pollution from biomass will drive climate change. The likely impacts of climate change are expected to increase the health disparities in Springfield and across the commonwealth. Increases in temperature, increased precipitation and flooding may create even greater disparities and negatively impact individuals with pre-existing conditions and other vulnerable populations as follows:

- Increases in temperature and heat waves– Individuals with diabetes, obese individuals, children, elderly, hypertension, stroke, and depression are all at risk for negative effects of increases in temperature (Kovatz 2008). In some cases, such as children and older adults, bodies have a difficult time adjusting to the increased temperature, particularly in the absence of air conditioning. Elderly adults in assisted living institutions have been found to be at particular risk. Heat stress can also increase strain on the cardiovascular system which would negatively impact those with existing cardiac disease (e.g. stroke). Also, some common medications may prevent the body from adjusting to increased heat (e.g. diuretics used to treat hypertension). The increase in temperature may also increase ozone pollution levels which would potentially adversely affect all residents but particularly vulnerable populations which include the elderly, children, and individuals with asthma, COPD, stroke, and diabetes (Eze 2014)(Anderson 2012; Brooke 2004).
- Flooding or extreme weather conditions would have the potential to destroy or cause damage to houses – Damage sustained from these conditions would lead to

exposure to hazards in the home, including lead, asbestos and mold. Disrepair could also create opportunity for pest infestation, which is a trigger for asthma morbidity, in addition to mold exposure. It is estimated that 21% of asthma cases can be attributable to mold and moisture exposure in housing and buildings (Mudarri & Fisk 2007).

- Extreme weather events Such events may negatively impact mental health due to the stress and strain of homelessness, loss of property, etc.
- Rising temperatures, increased precipitation and flooding, and extreme weather events that will likely occur as a result of climate change may negatively affect the health of a large number of at-risk Springfield residents, including those with asthma, COPD, stroke, hypertension, diabetes, obesity, depression.

Environmental Justice Community

In addition to the health disparities, the potential environmental and health impacts on Environmental Justice communities with the introduction of a biomass incinerator should be considered. Environmental Justice Communities are those identified as having vulnerable populations that often experience disproportionate exposure to environmental hazards. The state of Massachusetts' Executive Office of Energy and Environmental Affairs established an EJ policy that aims to reduce potential added environmental burdens on Environmental Justice communities in Massachusetts, specifically focusing on neighborhoods that have a large percentage of low-income, minority racial/ethnic populations, immigrant, or non-English speaking populations. Based on these measures, much of Springfield is designated as Environmental Justice community.

Springfield's Strong, Healthy, Just: Climate Action & Resilience Plan and the Commonwealth's Global Warming Solutions Action call for ambitious actions to reduce greenhouse gas emissions. The proposed RPS changes lead us in the opposite direction by promoting biomass and its resulting pollution.

For the health of our communities, we urge the DOER to save the renewable energy credits and subsidies for truly clean energy like solar and wind power, rather than biomass which must be monitored extensively to prevent public health impacts.

Sarita Hudson

Director, Pioneer Valley Asthma Coalition

Director of Programs and Development, Public Health Institute of Western Massachusetts