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**PHYSICIANS FOR SOCIAL RESPONSIBILITY/PIONEER VALLEY OPPOSE  
CONSTRUCTION OF BIOMASS POWER PLANTS IN THE PIONEER VALLEY**

It is the finding of the Physicians for Social Responsibility that the biomass power plants being proposed for several Pioneer Valley locations would contribute to particulate air pollution emissions in a region that already has pollution problems, and therefore we oppose the construction and operation of such plants.

Particulate air pollution is deadly. This has been stated by the American Lung Association, the American Heart Association, the World Health Association, and the US Environmental Protection Agency. According to the World Health Association roughly 800,000 people globally die annually from exposure to particulate air pollution.

Since the Stone Age hominids have been dependent on biomass combustion as an energy source for heating, cooking, and even protection from wild beasts. The ancient Roman philosopher Seneca (61 AD ) noted the adverse health effects of combustion-related "pestilential vapors and soot". Since medieval times air pollution from combustion has been recognized as a cause of adverse health effects, which lead to the banning of coal burning in London in the 13 century and again during Elizabeth I's reign. Particulate air pollution, specifically, has been recognized a cause of excess mortality since the infamous London Fog episode of 1952 which was responsible for thousands of deaths. Currently, the World Health Organization estimates particulate air pollution to be the 13th leading cause of death globally.

Hundreds more modern epidemiologic studies have described an association between elevated particulate air pollution levels and mortality and other adverse health effects.

In the 1980s many large cross sectional studies observed an association between living in an area with higher particulate air pollution levels and increased mortality rates. Since the 1990s time series studies have consistently shown that when particulate air pollution rises, within a day or two mortality rates increase. Case control studies identified the groups at increased risk of death during these episodes; these are the elderly, and those with chronic heart and lung disease. Since the 1990s prospective cohort studies have followed individuals with defined risk characteristics (for example, smoking, occupation, etc) and found that those living in areas with higher particulate air pollution levels have a higher risk of dying.

Strikingly, these associations have a linear dose response relationship. Thus, as particulate air pollution levels rise, mortality rates rise; as pollution levels drop, mortality rates drop. Studies have consistently not observed a threshold for this effect, in other words, the excess mortality effect is observed down to very low air pollution levels, well below those levels that the US EPA officially considers safe according to their National Ambient Air Quality Standards. Reportedly the EPA is reconsidering those standards to bring them more in line with the scientific data.

The association between particulate air pollution levels and mortality is considered causal; in other words, the scientific research has satisfied the criteria for considering the association proven. This is based on a clear dose response relationship, a remarkable consistency of the results observed by many different investigators using different techniques in different geographic regions, even throughout the world. Furthermore, the association is consistent with findings of many studies which find adverse health effects of particulate air pollution: increased asthma attacks, increased asthma medication use, increased days lost from school and work due to chest illness, increased emergency room use for heart and lung disease, and increased hospitalization rates. Additionally, the biological mechanisms have been clarified in recent years: particulate air pollution causes anginal chest pain, electrocardiogram changes indicating inadequate oxygen supply to the heart, increases in cardiac autonomic instability, increases in cardiac rhythm disturbances, and increases in myocardial infarction (heart attack). Indeed, there is no known component of the unstable cardiac syndrome which is not exacerbated by particulate air pollution continues. This concatenation of findings has led the scientific community to consider the association between exposure to particulate air pollution and increased cardiac and pulmonary mortality to be considered causal.

Most recently, a study in the *New England Journal of Medicine*<sup>1</sup> examined life expectancy in 211 counties associated with 51 United States cities; this study found that a decrease in 10 microgram per cubic meter in air pollution levels was associated with a 0.6 year improvement in life expectancy. Interestingly, Springfield, Massachusetts was a city included in the study. According to the interactive graphic published on the associated web site, from 1978 to 1982 Springfield has a PM2.5 (fine particulate air pollution) level of 17.6 microgram per cubic meter, and from 1997 to 2001, PM2.5 was 11.5 . This drop in air pollution was accompanied by an increase in life expectancy from 74.7 to 77.1 years. Elimination of particulate air pollution would be expected to result in an increase in life expectancy of most of a year. Clearly, any increase in air pollution, as would result from the construction of a major new particulate air pollution source, would result in a lowering of life expectancy, trending to reverse gains made in the last 20 years.

If the proposed biomass power plants are built in the Pioneer Valley, the resulting excess air pollution would exacerbate an already unacceptable public health burden.

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<sup>1</sup> Pope CA III, Ezzati M, and Dockery DW. Fine-Particulate Air Pollution and Life Expectancy in the United States. *N Engl J Med* 2009;360:376-86)

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