SAVE AMERICA'S FORESTS

Fact Sheet

BIOMASS INCINERATION HEALTH ISSUES

Introduction: The burning of biomass in incinerators adds dangerous pollution to the local environment, increases global warming, and is harmful to public health.

Nonetheless, biomass energy, including biomass incineration, makes up 50 percent of so-called renewable energy currently used in the US. Biomass incineration is also part of numerous bills in Congress, such as the Waxman-Markey Bill (H.R. 2454) known as the American Clean Energy Act of 2009, which was passed in the House of Representatives. By labeling biomass as clean "green" energy, this legislation would cause billions of dollars to be funneled into construction of biomass incinerators and logging of forests, instead of that money supporting truly clean, non-polluting energy such as solar and wind energy.

Summary: The burning of trees, chemically treated wood, garbage and other materials in biomass incinerators releases extremely toxic pollutants that are known to cause many diseases and fatalities. Biomass power plants emit particulate matter that has been scientifically proven to increase the risk of premature death, asthma, bronchitis and heart disease[1]. Additionally, this burning process creates numerous byproducts including nitrogen oxides and volatile organic compounds that increase smog and ozone, which are well known to increase lung disease and mortality[2]. Other extremely dangerous pollutants are also released from burning wood and garbage; these include: sulfur dioxides, which contribute to respiratory diseases[3], arsenic[4], which increases the risk of cancer, and mercury, that increases the risk of brain and kidney disease and affects the development of fetuses.

Particulate Matter

Particulate matter known as PM 2.5 are fine particles whose diameter is 2.5 microns or smaller. These particles are released into the air from combustion units and industrial boilers. The key issue with these particles is their size. Being smaller than 10 micrometers, they are able to penetrate deep into the lungs and also reach the blood stream, hence affecting both the lungs and heart. Exposure to PM 2.5 can result in decreased lung function, irregular heart beat, premature death in people with heart and lung diseases, aggravated asthma, and the development of chronic bronchitis. In addition, the 2004 Clean Air for California study showed that an increase in particulate matter will lead to an increased risk of developmental damage of the central nervous

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[1] EPA Particulate matter: http://www.epa.gov/air/particlepollution/health.html, and "*Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases"* in JAMA March 2006, p.1127-1134.

[2] *Long-Term ozone exposure and mortality*, in New England Journal of Medicine 2009 p. 1085-1095

[3] Agency for toxic substances and disease registry, http://www.atsdr.cdc.gov/tfacts116.html

[4] Agency for toxic substances and disease registry, http://www.atsdr.cdc.gov/tfacts2.html#bookmark05

system. Though children and older adults will be the most affected, even healthy adults can experience temporary symptoms resulting from high level of particle pollution exposure. According to the American Lung Association "the PM has not only a trigger effect but also a sustained effect which compromises cardio respiratory physiology".[5]

The EPA has been advised of the public health consequences of particulate matter by the Clean Air Scientific Advisory Committee (CASAC). CASAC, established under the Clean Air Act, provides scientific advice on setting air quality standards. In 2006, CASAC wrote a letter[6] to the EPA expressing its deep concern that the EPA disregarded its advice in regulating the National Ambient Air Quality Standards (NAAQS), standards which will impact the public's health. More precisely, CASAC was concerned that the EPA's final rule on the NAAQS "does not reflect several important aspects one being that the annual particulate matter standards is not protective enough of human health'. CASAC recommended decreasing the annual primary standard from 15 micrograms/m3 to 13-14 micrograms/m3 due to "clear and convincing scientific evidence that significant adverse human-health effects occur in response to short-term and chronic particulate matter exposures at and below 15 micrograms/m3."[7] But, unfortunately the EPA ignored the letter and the advice, as the annual PM standards are still at 15 micrograms/m3.

Sulfur dioxide

Sulfur dioxide is one of six common air pollutants regulated under the Clean Air Act. Sulfur dioxide not only affects lungs, but may also generate other severe health consequences such as: burning of the nose and throat, breathing difficulties and severe airway obstruction. Children are more affected by sulfur dioxide pollution as they breathe more air for their body weight than adults. Long term scientific studies have shown that children who have breathed sulfur dioxide may develop more breathing problems later in life. Children with asthma are more sensitive than other children, even when facing low concentrations of sulfur dioxide.

Arsenic

Inorganic arsenic compounds are mainly used to preserve wood; therefore, the burning of treated wood by the biomass industry releases arsenic into the air. Exposure to volatile arsenic results mainly from breathing sawdust or burning smoke from this treated wood. In addition to causing sore throat and lung irritation, it is also known as a human carcinogen, increasing the risk of lung cancer, as determined by Department of Health and Human Service (DHHS) and the EPA[8]. Long-term arsenic exposure is also responsible for developmental delays in children and is a danger to pregnant women and fetuses.

Mercury

When heated, mercury is a colorless and odorless gas. Exposure results from breathing vapors in the air from spills, incinerators, and industries that burn mercury-containing fuels. Mercury

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[5] EcoLaw Massachusetts, Dr. William Sammons and Attorney Margaret Sheehan. Health Effects of Biomass Burning Under S. 1733, "Clean Energy Jobs and American Power Act". October 20, 2009

[6] Clean Air Scientific Advisory Committee Recommendations concerning the final National Ambient Air Quality Standards for particulate matter, September 29, 2006.

[7] Clean Air Scientific Advisory Committee Recommendations concerning the final National Ambient Air Quality Standards for particulate matter, September 29, 2006.

[8] Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic *(Update)*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

causes damage to the brain, kidneys and fetuses. Permanent brain damage from exposure to high levels of inorganic mercury may results in tremors, changes in vision or hearing and memory problems[9].

Ozone

Biomass combustion is also known to release nitrogen oxides; which help create ozone, a highly reactive oxidant gas. "Ozone reacts in the pulmonary airways, causing chest pain, shortness of breath, cough, wheeze, increased susceptibility to infection, decline in lung function, increases in asthma attacks, increases in medication use and increased rates of emergency room visits for respiratory diseases."[10] Indeed, in 2009 the New England Journal of Medicine published a long term study[11] demonstrating a significant effect of ozone exposure on the risk of death from respiratory causes.

Dioxin – Polycyclic Aromatic Hydrocarbon

The Massachusetts Breast Cancer Coalition[12] has highlighted links between toxins and the extremely high rate of breast cancer in their state. Power plants, especially biomass power plants, release dioxins and polycyclic aromatic hydrocarbons (PAH). Both of these toxins are human carcinogens formed by the incineration of many products, and "may cause mammary cell mutation that might lead to breast cancer."[13] Children and fetuses might also be affected by these cancer-causing mutations if exposure to dioxins occurs during development.

Conclusion

Summary: Biomass incinerators pose a known danger to the public's health. The toxic pollutants they release in the atmosphere will result in disease and premature deaths.

Congress and the Administration should no longer label biomass incineration as clean or "green" legislation, and it should be removed from Renewable Electricity Standard. No legislation should be passed which subsidizes construction of biomass incinerators or subsidizes logging on public or private land for use in biomass incinerators.

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[9] Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological Profile for Mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

[10] Massachusetts Medical Society, MMS Testimony in Support of House NO. 4458, "An Act to Limit Carbon Dioxide Emissions from Renewable and Alternative Energy Source", February 25, 2010

[11] "Long Term Ozone Exposure and Mortality" The New England Journal of Medicine, March 12, 2009

[12] Massachusetts Breast Cancer Coalition, Written Testimony in Opposition to the Building of the Palmer Renewable Energy Biomass Plant Presented by MBCC, *Springfield public health council, November 18, 2009.*

[13] Massachusetts Breast Cancer Coalition, Written Testimony in Opposition to the Building of the Palmer Renewable Energy Biomass Plant Presented by MBCC, *Springfield public health council, November 18, 2009.*