

Biomass* Position Statement

Background and Rationale:

Until this past century, humans depended almost solely on biomass to supply their energy needs. Today, while fossil fuels are used to create the majority of energy, concerns about air pollution, energy security and peak oil are forcing us to seek cleaner, cheaper, renewable and more readily available energy alternatives. As a result, biomass is often viewed as making a contribution to our nation's energy future. This is especially true in New England, which is both rich in biomass resources and heavily dependent on foreign oil. There is no region in the nation that has the combination of heavy dependence on fossil fuel and significant use of biomass for energy production and heating.

As individuals and communities start to focus increasingly on the use of biomass for energy, it is important that the health and environmental effects associated with this fuel are fully understood and considered. While biomass is often promoted as a carbon neutral and renewable way to generate energy, harvesting of the resource must be done in a sustainable manner, and needs to account for the use of conventional fossil fuels in the harvesting, processing and delivery of the fuel. In addition, burning wood, like burning any substance, releases toxic chemicals and particles which affect both the environment and respiratory health. In particular, biomass emissions contain fine particulate matter, sulfur oxides, carbon monoxide, volatile organic compounds, and various irritant gases such as nitrogen oxides that can scar the lungs.ⁱ Like cigarettes, biomass emissions also contain chemicals that are known or suspected to be carcinogens, such as polycyclic aromatic hydrocarbons (PAHs) and dioxin.ⁱⁱ

For vulnerable populations, such as people with asthma, chronic respiratory disease, and those with cardiovascular disease, biomass and diesel emissions are particularly harmful. Even short exposures can prove deadly. A growing number of studies are pointing to the direct impact of increased particle pollution levels and an increase in heart attacks.ⁱⁱⁱ The particles produced by biomass and diesel emissions are extremely small and are unable to be filtered out of our respiratory system. Instead, these small particles end up deep in the lungs where they remain for months, causing structural damage and chemical changes. In some cases the particle can move through the lungs and penetrate the bloodstream. The health impact of particle pollution is not limited to individuals with pre-existing conditions.

In some uses of biomass, such as for electricity generation, there is the added problem of diesel exhaust emitted by trucks delivering wood to the power plants. The age of these vehicles, the type of diesel fuel being used, and idling practices have a significant impact on the level of pollution emitted from these trucks. Concern over the health effects of the particulate matter produced by diesel

engines is growing. Recent studies have shown that the proximity of a child's residence to major highways is linked to hospital admissions for asthma, and there is a positive relationship between school proximity to freeways and asthma occurrence.^{iv} Truck and traffic intensity and exhaust measured in schools were also significantly associated with chronic respiratory symptoms.^v

The concerns about generating electricity through biomass become even more troubling when the efficiency of burning biomass in some applications is considered. For instance, when used strictly for electricity production, biomass plants have an energy conversion efficiency (efficiency of a device that converts one energy form into another) of approximately 20 percent.^{vi} Another way to state this is that for every five cords of wood burned; only one actually produces electricity even though all five produce pollution.

Another growing use of biomass is to heat public buildings and schools^{vii}. While it is understandable that government is looking for ways to cut costs and support the local wood economy, conversion to wood fuel can introduce additional pollution into the local environment. Wood fired boilers used at schools built without advanced combustion design, best available control technology and well trained operators will result in excess exposure to school age children – children who are developing and very susceptible to the ill effects of air pollution.

There is a strong tradition in New England of burning wood for residential heating. While there are national emission standards for new wood stoves, many of the stoves in use are not compliant with U.S. Environmental Protection Agency (EPA) emission standards. These emission standards only regulate the emissions of an individual stove and do not consider the serious health risks of the accumulation of wood burning, especially in more densely populated areas.^{viii} These wood stove standards were first adopted in 1988 and have not been updated. Further, a class of unregulated wood burning devices appeared in the early 1990s called outdoor wood boilers (OWBs). Not only were these units exempt from national regulation, their design and construction resulted in gross air emissions and very inefficient operation: the emissions of one OWB could exceed the emissions of nearly a dozen wood stoves!

In addition to the local problems caused by widespread biomass burning, two other related issues have not been addressed. First, the amount of monitoring for particulate air pollution is not even close to what is needed. Second, our public health laws are not effective in helping people who are being exposed to biomass smoke by a neighbor. The difference in how sewage system incursion on to neighboring property is addressed is much more clear and reliable than how wood smoke "trespassing" is treated by public officials.

Position:

The American Lung Association of New England (ALANE) believes that we cannot afford to trade our health to meet our energy needs. We strongly support rapid movement towards clean, safe and renewable energy to protect our environment and the air we breathe. For electric generation this includes increased emphasis on highly efficient use of existing generation augmented with properly designed and sited new wind, solar and tidal sources. We support increased emphasis on energy efficiency as the most rapid and cost effective way to reduce energy consumption and the pollution that accompanies it. Only after the need for additional power has been demonstrated and clean, renewable options have been shown to be unavailable will the ALANE even consider supporting any new fossil fuel energy source that would add to the air pollution in an area.

Biomass energy can make an important contribution to meeting our energy needs. However, it must be done in accordance with important principles. Otherwise the potential health and environmental consequence could outweigh any benefits.

- Wood harvested for energy must be done in a sustainable manner
- If wood is to be used to fuel centralized electric generation, it should only be done in a combined heat and power (CHP) generation facility. Otherwise this is an inefficient use of the resource, and competes with higher more efficient uses of the resource.
- If wood is used for school heating, it should not be considered until it has been demonstrated that the building envelope is highly efficient, the combustor is of an advanced combustion design, the most advanced emissions control systems are being used, the operators are well trained, and the fuel is procured under a 'sustainable' plan.
- Programs to 'change-out' woodstoves and to 'sunset' the use of OWBs that do not meet adopted emission standards need to be implemented at the state level.
- National standards for wood stoves and other devices that burn wood need to be updated to represent current technology and set future effective standards based on evolving technology.
- Programs need to be designed and delivered to educate users on the proper seasoning of wood fuel for the device it will be consumed in and in the proper operation and maintenance of wood burning devices.

The American Lung Association of New England understands the need for many people in New England to burn wood for heat. As a public health organization, we understand that it is unhealthy to live in a cold house or apartment. We also support the continuing efforts to develop more efficient wood burning appliances and programs that provide incentives for individuals and businesses to “change out” older, more polluting wood-burning appliances for newer more efficient and less polluting ones. We support efforts to rewrite and enforce public health laws that protect people from the dangers of wood smoke exposure. As in the area of secondhand tobacco smoke, the right to breathe healthy air is primary. It supersedes any alleged “right” to burn wood.

* For the purposes of this document the terms biomass and wood are used interchangeably.

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ⁱ *Biomass Emissions* . (2008, March). Retrieved October 6, 2009, from Biomass Energy Resource Center: <http://www.biomasscenter.org/resources/fact-sheets/fse-biomass-emissions.html>

ⁱⁱ English P, N. R. (1999). Examining associations between childhood asthma and traffic flow using a geographic information system. *Environ.Health Perspect.* , 761-767.

[T. Bond]Hearing on Black Carbon and Climate Change, Hearings before the House Committee on Oversight and Government Reform, U.S. House of Representatives (October 18, 2007) (testimony of Professor Tami Bond, University of Illinois at Urbana-Champaign).

ⁱⁱⁱ *HEALTH EFFECTS OF BREATHING WOODSMOKE*. (n.d.). Retrieved October 6, 2009, from United States Environmental Protection Agency: HEALTH EFFECTS OF BREATHING WOODSMOKE

^{iv} Lin, M. H. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. *Environmental Research* , 73-81.

^v Patricia van Vliet, M. K. (1997). Motor Vehicle Exhaust and Chronic Respiratory Symptoms in Children Living near Freeways. *Environmental Research* , 122-132.

^{vi} *Costs of Biomass Power*. (June, 7 2007). Retrieved October 7, 2009, from US Department of Energy: http://www1.eere.energy.gov/tribalenergy/guide/costs_biomass_energy.html

^{vii} RESOURCE POLICY: Wood Energy in America, Richter Jr. et al., Science 13 March 2009: 1432-1433
DOI: 10.1126/science.1166214

^{viii} *The Governor's Wood-to-Energy Task Force Report*. (2008, September). Retrieved October 7, 2009, from http://www.maine.gov/doc/initiatives/wood_to_energy/documents/WoodtoEnergyTaskForceReport.pdf