Position Paper on the Use of Outdoor Wood Boilers

American Lung Association of Indiana
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Background

As the costs of using fuel continue to rise, it is evident that homes and businesses around the United States are beginning to feel the financial burden. Many people have turned to alternative sources for heating homes, businesses, water, etc. An increasingly popular method of generating heat has been to use an Outdoor Wood Boiler (OWB).

However, evidence is plentiful stating the use of outdoor wood boilers has negative and widespread effects on the health of those who breathe the air contaminated with the pollutants from wood smoke.

The American Lung Association of Indiana urges individuals to avoid using outdoor wood boilers for residential heating purposes, citing the devastating effects that they can have on the lung health of those who are exposed.

What is an Outdoor Wood Boiler (OWB)?

A typical OWB is used as an alternative home or commercial heating source for such items as domestic heat and hot water. An OWB is a small metal shed that contains a firebox surrounded by a water jacket. The combustion of wood heats the water within the water jacket. A thermostat regulates the circulation of heated water through underground piping to the home, pool, or other source on a demand basis. Smoke passes through a short chimney that extends a few feet above the roof of the shed (1).

What are the health concerns related to OWBs?

The most specific concern regarding OWBs is that the contents of the smoke released are 1) toxic and 2) have the ability to bypass the body's natural filtration system to get deep into the lungs.

The toxins emitted from OWBs are very dangerous to lung health. These toxins include carbon monoxide, volatile organic compounds, and carcinogens, which are linked with the causes of various cancers (1, 2, 3). These toxins can aggravate existing lung problems, and are credited with causing other lung health problems; 571,104 Hoosiers currently battle asthma and 1,293,711 Hoosier currently suffer with other incurable lung diseases. Those suffering these lung diseases are profoundly affected by poor air quality.

Secondly, OWBs emit particulate matter, which is one of the 6 major pollutants of air quality. Particulate matter is usually filtered out through the body's defense and protection system; however, the fine particulate matter that OWBs release into the air is smaller than that which the body can catch and is breathed in deeply and is lodged into the lungs. It is classified as $PM_{2.5}$. Increased exposure to $PM_{2.5}$ aggravates existing lung issues and is a factor in causing other problems with lung health (1).

Populations most at risk for the negative effects of wood smoke are infants and children (under 18), those over 65, pregnant women, those who are current or former smokers, and those who suffer from lung ailments such as asthma, emphysema, chronic bronchitis, lung disease, etc (1,2,3).

The design of OWBs also contributes to the problem. First, the boilers are built with a short stack, which results in the smoke staying in the lower atmosphere (3), the air we breathe everyday. Secondly, because the heat generated in the OWB has to travel through pipelines to get to the resident, the OWBs need to be constructed often within close range of the home/business so that the heat is not lost as it travels. This construction does not allow the smoke to disperse; therefore, it is present in dense quantities around the neighboring buildings (1). Thirdly, OWBs are burning all year long, which makes them a consistent issue (4). Finally, OWBs are also frequently used as incinerators for trash, commercial waste, other dirty fuels, etc. which should not be used in residential combustion (4).

What relevance does this have to Indiana?

In the northern counties of the Indiana, outdoor wood boilers are more commonly used. According to the American Lung Association's 2006 State of the Air Report, the counties of La Porte, Lake, and St. Joseph comparatively have some of the highest incidents of pediatric asthma, adult asthma, chronic bronchitis and emphysema in the state, especially in minors and those over 65 (5).

Lake, LaPorte and St. Joseph counties all received an "F" when grading the number of days that were "High Ozone". These three northern counties all had at least 22 days when the ozone level was in ranges declared unhealthy by the EPA. Lake County had such a high number of days in which the daily $PM_{2.5}$ concentration was "unhealthy for sensitive groups" (those with lung/allergy issues) that they failed the annual evaluation (5). Clearly, the air quality in these counties is poor and using OWBs, which spread toxins in an already polluted environment, is exacerbating the quality of life for those who suffer from lung disease.

Concluding statements

The occurrence of lung health problems in the above listed counties (and in all counties in the state), in combination with the environmental conditions, demonstrate that there are serious issues affecting the well-being of Indiana residents. With all these negative factors working against the lung health of people throughout Indiana, measures must be taken to avoid further aggravating poor health and serious environmental conditions. Therefore, the American Lung Association of Indiana recommends that outdoor wood boilers not be used as an alternative heating source.

References:

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5) State of the Air: 2006. American Lung Association. 2006. 120-123. 28 Feb. 2007 <http://www.kintera.org/atf/cf/{3E311E01-3496-43CF-9F99-DB1F427FAA0F}/SOTA06_Final.pdf>.