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Testimony of David R. Brown Sc.D., Public Health Toxicologist Environment and Human Health, Inc.

Bill S.B. 830

AN ACT PROHIBITING THE USE OF CERTAIN OUTDOOR WOOD-BURNING FURNACES.

To Chairs Senator Ed Meyer, Representative Richard Roy, Vice Chairs Senator Maynard and Representative Davis and Members of the Environment Committee:

My name is David Brown. I am Director of Toxicology at Environment and Human Health, Inc. (EHHI), a group of 9 doctors and health professionals dedicated to protecting human health from environmental harms. We receive no money from businesses or corporations. I am a resident of Westport Connecticut.

As a public health toxicologist, I am in strong support of this bill. I want to focus my comments on the Phase II outdoor wood furnaces, also known as outdoor wood boilers. also known as hydronic heaters. I directed a research project to determine the human health exposures and risks in homes near this type of wood burning device. EHHI has reported our findings from these studies which can be found on the website of Environment and Human Health, Inc.

For several years states have attempted to reduce the hazards from outdoor wood furnaces used to heat water as part of "hot water heating systems." The focus has included limits on setbacks from occupied houses and establishing stack heights. More recently the industry, at the urging of EPA has developed a "phase II" device to limit the emissions on the basis of heat energy produced measured in British Thermal Units.

- None of these studies have included real time monitoring of toxics in the ambient air near the outdoor wood furnaces.
- None of the studies have quantitatively measured the components of the smoke emissions from the devices under 'field' conditions.
- Interpretation of the hazard has instead been based on a theoretical modeling procedure that estimates the 24 hour average ambient air level under idealized use conditions.
- Nearly all considerations from the industry and EPA are <u>limited to the amounts of particulate matter released over a 24 hour period.</u>
- In fact the EPA "qualification" of phase II is based primarily on 24 hour particulate emissions with a 1 hour maximum from a representative outdoor wood furnace tested

only in laboratory conditions. All "hang tag" qualification is for any heater is based only on a the laboratory test of a representative device.

Such a testing approach provides only limited information and is not adequate for the assessment of the in-field acute health risks from the emissions reaching and penetrating neighbor's houses.

The data from the above actions is not adequate to protect the public health because of the nature of the health effects induced by wood smoke and its particulates.

- Attacks of respiratory disease, asthma, chronic obstructive lung disease and bronchitis are precipitated by exposures of less than two hours.

- Ischemic heart attacks and also induced by brief exposures of a couple of hours. In fact the one documented death from emissions from an outdoor wood furnace in Benson Vermont occurred after exposures of less than 12 hours. That person died of an ischemic heart attack.

- Moreover there are widely reported attacks of respiratory conditions requiring medical treatment and visits to emergency rooms in persons living hundreds of feet from outdoor wood furnaces.

Given the severity of the health risks to persons who have no control over the use of the outdoor wood furnace in their neighborhood extreme care must be taken in developing rules for the use of the phase II units. The following is a list of the problems induced by burning wood in outdoor wood furnaces.

1. All houses in the impact zones of the devices draw outside air in to support combustion in their own heating devices and stoves. That process draws in the emission from the outdoor wood furnaces and causes it to accumulate in the houses. **EHHI demonstrated the severity of this phenomena in its study of the PM 2.5 levels inside the bedrooms of house between 100 and 800 feet of an outdoor wood furnace. Levels were induced inside the houses orders of magnitude over that in comparison houses and the EPA 24 hour ambient air standard for PM 2.5. When examined on an hourly basis the PM 2.5 levels exceed the concentrations known to induce the most severe health effects. The report can be found at: http://www.ehhi.org/reports/woodsmoke/**

2. The 'the set-back' distances and the 'stack heights' are based on 24 hour averaged meteorological conditions. It has been incorrectly assumed that the winds will disperse the cold plumes from the outdoor wood furnaces. The distances cannot compensate for the severely reduced diurnal mixing conditions that occur during the dawn and sunset hours or on nights when there is cloud cover which reduces the mixing depths assumed by EPA. **The EHHI indoor monitoring data shows that there are periods of severe intrusion of outdoor wood furnace smoke emissions into houses during periods of low wind speed. Such periods occur on ¼ of the days in New England and possibly in the Midwest. Similar findings have been reported from Wisconsin.**

3. Persons living in homes impacted by the outdoor wood furnaces have reported Carbon monoxide warning from CO meters in their houses. More seriously, persons report signs and symptoms

consistent with chronic carbon monoxide poisoning. No measures of ambient CO levels near the outdoor wood furnaces have been taken by EPA, the industry or any local government even though carbon monoxide represents over 50% of the emissions by weight. **The carbon monoxide observation illustrates the highly limited assessments of the hazardous emissions from the devices. In fact the data collected by EPA in its study of 4 outdoor wood burning devices is still under review and not available for regulatory evaluation. It is essential that data be available before any decision can be reached regarding the phase II regulations.**

4. Even using the best dry hard wood will still cause toxic wood smoke emissions at the levels emitted by outdoor wood furnaces. These devices emit wood smoke 24/7.

5. Substitution of laboratory testing and 24 hour modeling severely limits the ability to determine the actual ambient air impacts from burning wood in outdoor wood furnaces. Wood stove data has been used for comparison but wood stove induced smoke differs from the outdoor wood furnace smoke in two important ways. (1) smoke from stoves is released from a hot chimney at or above the roof tops and still contains the heat energy needed for dilution and buoyancy necessary for elevation into the upper atmospheres, (2) wood stove smoke come from a hotter burn and is not retarded by the water surrounding the fire in an outdoor wood stove. **Retarded flames from water are serious sources of the generation of carbon monoxide, as was demonstrated by the serious CO poisonings that occurred when indoor hot water heaters were first introduced.**

6. EPA qualification rules attempt to limit the peak emissions to 18 grams/hour. There are some data that indicate that the original devices emission rates are 34 grams/hour or more. Simple estimates of the levels of PM 2.5 that would be in the ambient air if 34 or 18 grams per hour are released are 125 and 66 ug/m3 if the release is uniform over the one hour period for the 34 and 18 gram emission rates respectively. If however the more likely the dense smoke is released in 30 or 15 minutes intervals the ambient levels are projected to be 250 and 130 ug/m3 or 503 and 264 ug/m3 respectively. **All of these values greatly exceed the EPAs 24 hour standard and fall in the EPA's Air Quality Index warning of "hazardous levels" or more serious. In contrast to EPA, the state of Washington enforces an hour emission rate of 4.5 grams per hour for wood burning which is a more appropriate rate.**

7. Enforcement in Connecticut requires use of visibility measures that cannot be used at night. We strongly suggest that ambient real time monitoring be required under any conditions where a medical or public health professional expresses concern for the health of persons impacted by an outdoor wood furnace device.

Summary:

The proposed regulation banning the use of outdoor wood boilers in Connecticut in non agricultural uses is the correct action for Connecticut to take.

The central problem with the EPA's approach qualifications of Phase II outdoor wood furnaces is that the known acute health effects from inhalation of wood smoke occur after a brief, few hours at most, exposure to shot episodes of dense smoke containing a mixture of toxics. Yet all of the data and air modeling is limited to 24 hour exposures to one pollutant PM 2.5 even though PM 2.5 does not represent the majority of the toxic chemical constituents by weight (less than 20%).

Further, although there are grave health effects to those near the 'outdoor wood furnaces' including a death, no agency has undertakes any human health studies, and none are in progress or planned. The health effects are sobering, a documented death, and a broad base of lung injury reported by doctors treating residents who live near the outdoor wood furnaces. Even a cursory examination of the health issues, including loss of time from school and medications to support serious respiratory disease leads to the conclusion that an unsafe device is on the market and should be treated as such.

I would be happy to expand on these comments or to provide any data or studies that explain the concerns expressed in this letter. Our studies are available at the EHHI website, (EHHI.org)

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