

## **Application of junk mail at the household and community level as a domestic and recreational heat source**

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An alternative fuel briquette composed of a combination of ordinary yard waste and junk mail has proven to have a wide spread application in the developing nations where fuel wood demand is causing a significant part of the rampant deforestation. At the same time, the average United States household receives over 1.5 pounds of non-recyclable “junk” mail per day as we watch our heating bills rise. One solution is to make fuel briquettes at the household level. Legacy foundation has successfully introduced the technology in several developing nations where scarce wood fuel is the sole source of energy. In the industrialized nations however the proposition that the household could burn junk mail, immediately poses the concern that its combustion may emit atmospheric toxins from the ink and paper. This has prompted a comparative scientific investigation of thermal properties, emissions and ash residues from the briquettes versus charcoal, fuel pellets, and firewood, in partnership with the Chemistry Department of Southern Oregon University. The results have been encouraging.

The fuel briquettes, with an average mass of 125 gm (at a 40 to 50% concentration of junk mail), were found to have an effective heating duration of 40 to 50 minutes, achieving temperatures upwards of 800 degrees Centigrade early in the burn cycle. The gaseous emissions contained sulfur, iron, and calcium. The ash residue contained iron, calcium, zinc, titanium, and silicon. In comparison to wood fuel and wood based fuel pellets, based on x-ray fluorescence spectroscopy, the fuel briquettes do not appear to contain or emit toxic levels of any of the above elements.

The paper details the design and process of the analysis, and presents the analytical results of the tests. It concludes with a proposal for the full development of a compact device for efficient household and community based production of fuel briquettes from junk mail and yard wastes, where regulations permit their use in household wood stoves, fireplaces and recreational cookstoves.