

target homes heating with electricity in states that have mandates to reduce electricity usage. Wood stoves are also particularly suited to rural areas where electricity outages are an issue as they can continue to heat the home regardless of power.

C. Masonry Stoves

Masonry stoves have a small, powerful firebox and a large masonry mass that can absorb tremendous amounts of heat from the fire and then re-radiate that heat into the living space for many hours afterwards. A basic heater core (prefabricated or built on-site baffle system) costs about \$5,000, often with an additional \$5,000 or more for installation and larger mass. They have been used for centuries in Europe, Scandinavia and parts of Asia. Masonry stoves require less fuel and can radiate the heat from a single fire for much longer than smaller stove styles. Soapstone masonry stoves generally emit between 18 and 20 hours of radiant heat from a single burn period. Some high thermal mass units on the market today can produce 30 or more hours of heat.

The EPA has not yet regulated the emissions from Masonry stoves, so there is no required third



party emission testing. However, a few companies actually go through the required testing independently, and the emissions from masonry stoves are low, averaging 2.9 grams of particulate matter per kilogram of fuel burned, and range from 1.4 to 5.8 g/kg with some stove at .9 g/kg. Since the actual burn time is much shorter than the time the heat is radiating, the EPA's grams per hour (of burn) emissions measurement does not reflect the emissions of this unique technology very well. However, the small firebox size and hot fires do produce very low hourly emissions—generally under 2 g/hr.

Policy Considerations

Masonry stoves have often been left out of biomass incentive programs, which is perhaps the result of both lacking federal standards in the absence of EPA requirements and a general lack of awareness about masonry stoves in the United States. Another main reason is that because most regulators agree that masonry heaters are not causing air quality problems, they have adopted the viewpoint that investing in regulation of these appliances would not yield significant air quality returns. Jeremy Johnson from the masonry stove company Tulukivi notes that, “While this makes sense on a monetary level, it doesn’t make sense on a clean air level; promoting a cleaner product group would help to educate the public.”

In contrast, masonry stoves are one of the main types of biomass heating equipment that are incentivized in Europe. Masonry stoves that can meet third party emission thresholds should be included in more incentive programs. Though many of these stoves did receive the federal 30% tax credit in 2009-2010, the maximum allowable credit was \$1,500, so it was not a major incentive for appliances that often costs more than \$15,000. It is very likely that all masonry stoves would have qualified for the tax credit, but only a few had the testing to prove their emission and efficiency numbers. As of this publication, the EPA plans to include masonry stoves in their 2015 New Source Performance Standards, and as a result they will be better suited for inclusion in incentive programs. While these stoves can be quite expensive, they are a renewable energy that requires very little fuel wood to produce hours of radiant heat and should not be overlooked when designing incentive programs.