



INTEGRATED ENERGY SYSTEMS

CLEAN ENERGY TECHNOLOGIES

ETHANOL AS A RESIDENTIAL FUEL

Background

With an increasing concern about fossil fuel emissions of greenhouse gases, many are seeking alternative fuel sources. Ethanol is one such fuel.

When the ethanol is derived from organic sources it has the potential to significantly lower greenhouse gas emissions as compared to fossil fuels.

It will some day be practical to use ethanol or a blend of ethanol/oil, or even ethanol/natural gas as a residential source of fuel for furnaces and water heaters and as a first step, the IES Laboratory is investigating the conversion of oil fired furnaces and boilers to utilize ethanol as the fuel.

There are technical obstacles to overcome with such conversions and now is the time to start thinking about them.

Since many homeowners already have an oil fired furnace, a conversion kit would initially be the most cost effective way of introducing this new fuel.

The infra-structure for the delivery of ethanol would be similar to that for oil, making this the best fit.



Typical #2 Fuel Oil Flame

Issues such as elastomer seals, burner flames patterns, flame detection, heat transfer characteristics, and increased levels of heat exchanger condensation will have to be investigated.

The high hydrogen content of alcohol results in a latent heat loss than that is even higher than that of natural gas, making the potential for condensing heat recovery extremely attractive.

The economics of adopting ethanol as a residential fuel will be highly dependent on the relative cost of the fuels under consideration. The current Canadian production cost of organically (corn) derived ethanol is in the order of 40 - 50 cents per litre, which puts the desired selling price (70 cents per litre) above that of current fuels commonly available*. However, low cost imported alcohol from Brazil (26 cents per litre) is currently cost competitive and The US Governor's Ethanol Coalition / Iogen expects production costs to be in the order of \$1.30 US per Gallon, using the new cellulose Ethanol process. Early adopters may also be willing to pay a premium for a "Green Fuel".


* Source: Commercial Alcohols Inc.



Typical Ethanol Fuel Flame

Your Invitation to Work with Us


We are interested in collaborating with you. Please contact the Business Office to discuss your particular needs.

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