Small scale waste to integrated energy system for the Solomon Islands

Nufuels Ltd has developed a small simple pyrolysis system to convert waste plastic bags and bottles into energy suitable for local cooking, baking, drying and electricity. It has the potential to be extended to biomass.

The system is suitable for construction and easy use by communities in the Pacific, and is being developed under a NZAID project with Caritas Aotearoa New Zealand.

The system consists of a retort (left) fired typically by wood or fuel from the process. The retort will take around 7kgs of mixed Polyethylene and PET. The pyrolysis gases pass through a condenser (center left with cooling water in drum behind) with crude accumulating in the containers (center right). The incondensable gas (mainly methane/ethane mix) is stored in a water sealed system (right).

Around 5kgs of a viscous plastics crude and 2 kgs of gas is produced per cook. The crude has about the energy density of diesel but has a low flash point so needs to be handled like petrol. Unlike the gas however it can be distributed in a locale.

The gas is suitable for cooking and running in a petrol genset.

The crude is being used in a rocket stove (baking, drying) and experimentation with further distillation and gasification is ongoing.

Overall the system gives a local integrated source of energy to meet most needs, while helping to dispose of a difficult waste.

The only emissions to air arise from the burning of the various fuels. More complex plastics (e.g. brominated, chlorinated) do need to be avoided. Contact: leigh@bfsnz.net