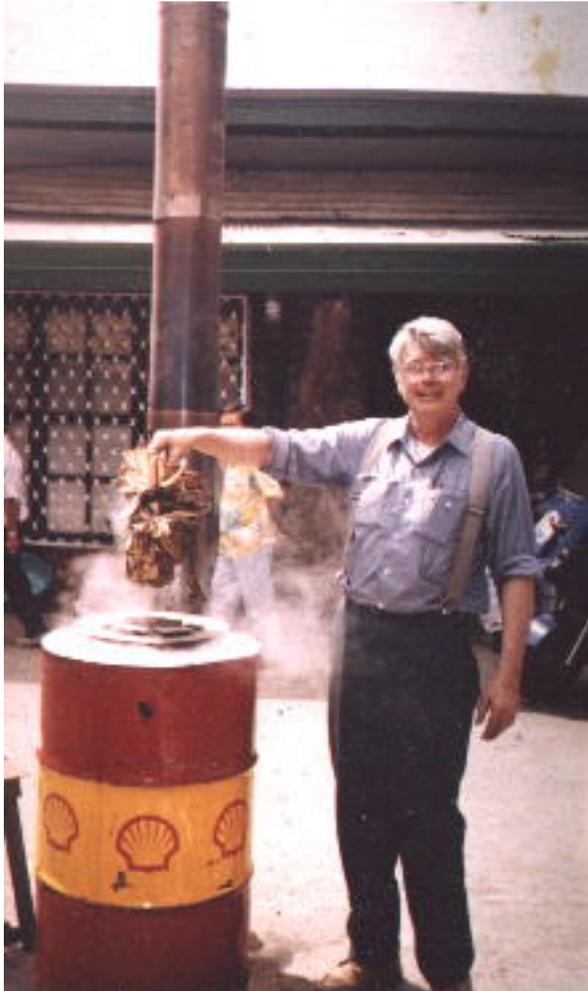


"TWERP?"

SMALL SITE WASTE-ENERGY RECOVERY PLANT landfill rubbish put to beneficial use



At Malabon, a Manila suburb in the Philippine Islands, Charles Mac Arthur, "TWERP" inventor, is shown heating water in a unit built on-site out of recycled materials, a small oil drum. The fire in this early system burns upside-down at temperatures as high as 1100°C, which would quickly consume the entire unit were it not for the clever balance of forces which transfer some of the heat to preheating incoming combustion air, with the balance of the energy transferred to the water jacket, from whence it can be taken for laundry or other beneficial uses. Fuel subsequently added to the crucible provides heat to totally reduce any carbon which may have remained from prior fuels, so that the amount of virtually inert ash which results is often as little as 1% of its former weight and volume. 100 barrels of rubbish burned in the unit would result in a single barrel of ash, which may in itself have further beneficial use. This is an example of a vertical unit, while later furnaces are usually horizontal.

BANANA STALKS FOR FUEL

Installed in an 8 x 8 x 20 foot cargo container at Quinhagak, Alaska, home of 540 Yup'ik Eskimos on the Bering Sea, this was the first "Tribal" waste to energy



COLD CLIMATE OPERATION

plant. Heat from high temperature burning of village rubbish warms water in a 300 gallon tank and later is pumped into overhead heaters in the Tribal Offices, Post Office and recreation rooms to supplement the building's oil furnace. It has taken several months to learn how to deal with the local climate and to get used to separating rubbish in the home into two classes, burnable and non-burnables. Once the operator got used to the unit, it can be expected to burn at very high temperatures, (no smoke, smell or noise) well above 1470°F in order to prevent the formation of dioxins. An Alaskan unit (by others) processes the same amount of rubbish, but costs 150 times more.

Built for restaurants, small hotels or lumber camp kitchens, this TWERP is shown here without its cabinet, during this firing test resting on the floor instead. It can be fueled with woodchips, kitchen trash, meat scraps, paper, cardboard, slab wood, stove wood, bones etc. A large full firebox width door allows for easy cleanout, while the unit will



LAUNDRY HOT WATER TOO

accept sawmill slabs up to 47" long. An 11 gallon water jacket provides continuous hot water for dishwashing and dining area heating, while an accessory heat recovery package in the stack may help to generate steam. The cooking surface is much like an old fashioned kitchen wood stove where cooking temperature is selected by sliding pots and pans to the proper area of the 18 x 48" surface. The fire burns upside down and the stove has gills.



With a permanent population of only 68 people, Monhegan Island off the coast of Maine grows to about 600 residents during the summer, plus up to a thousand hikers a day, "daytrippers" who come and go by boat. The island's dock is also the collection point for garbage and on a hot day can leave visitors with an unfortunate impression. This unit has a gravity fed rubbish feeder, but also uses a small amount of electricity (1/20th of a horsepower blower) in order to supply extra forced air to start the unit, and during the last few minutes of burn. Redesigned as a hot water resource for the hotel, restaurant or laundry, this unit will be fitted with the same 11 gallon water jacket shown in the kitchen TWERP above. Rubbish prevention begins at home.

MONHEGAN ISLE MODEL

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