INSTITUTIONAL SIZE RICE HUSK GAS STOVE

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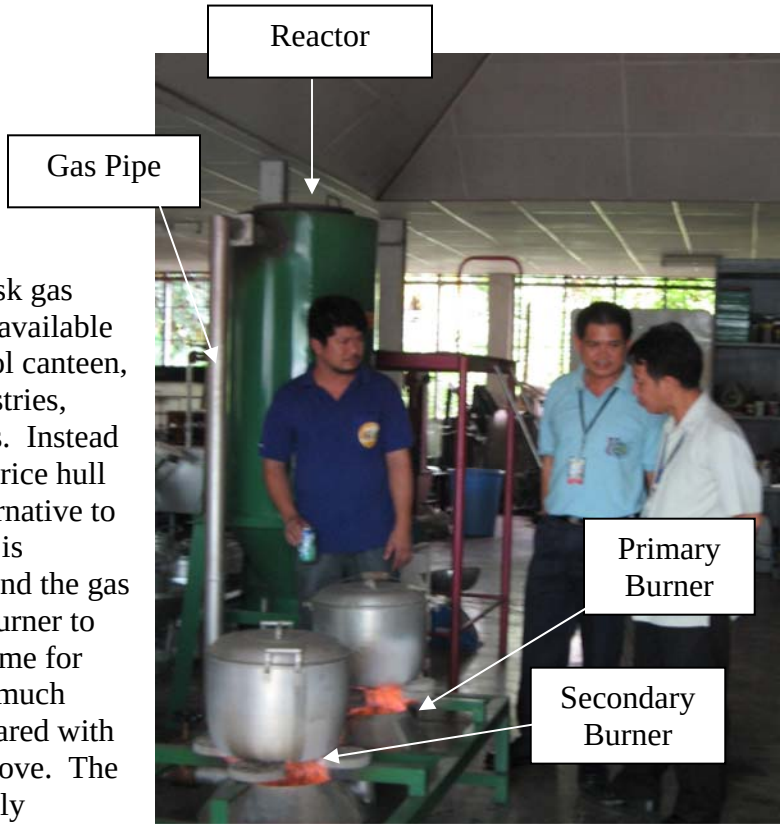
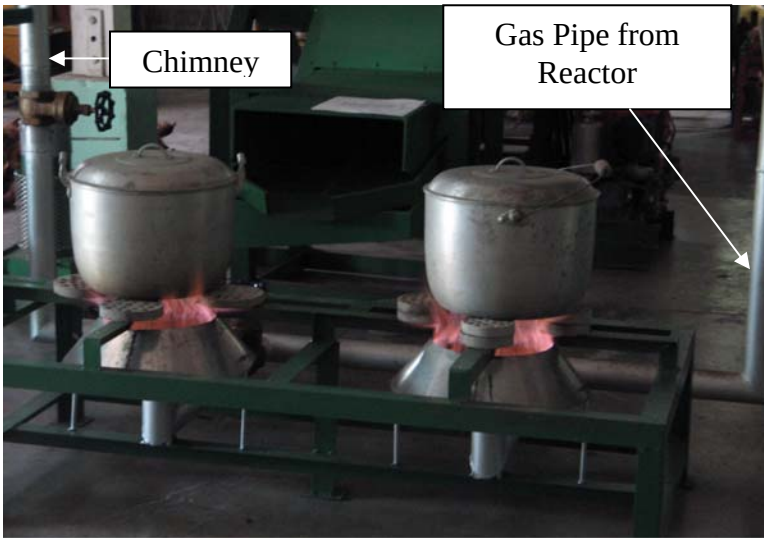
Good news!

An institutional size rice husk gas stove technology is already available for use by restaurants, school canteen, small scale processing industries, catering services, and others. Instead of spending fuel for LPG, a rice hull fuel gas stove is a good alternative to reduce fuel cost. Rice husk is gasified inside the reactor, and the gas generated is ignited in the burner to produce luminous bluish flame for cooking. The stove is very much convenient to operate compared with other designs of rice husk stove. The amount of flame can be finely controlled during operation.



The Institutional Size Rice Husk Gasifier

The institutional size rice husk gas stove technology is another development in line with rice husk gasification project of the Department of Agricultural Engineering and Environmental Management of the College of Agriculture, Central Philippine University in Iloilo City, Philippines. This technology was developed with the assistance from the group of undergraduate agricultural engineering students Lucio Larano, Daniel Belonio, Norman Apote, April Belasa, and Xykster Pelaez.



The Burners Designed for 20-Liter Capacity Pot

The stove as shown consists of (1) Primary and Secondary Gas Burners - where the gas is burned to produce luminous blue

flame color, (2) Fuel Reactor - where rice husk is gasified during operation by burning the fuel with limited amount of air, (3) Char Chamber – where burned fuel is discharge from the reactor after gasification, (4) Blower – which supplies the needed amount of air for gasification, (5) Char Lever – which discharge burned rice hull after gasification, (6) Control Switch – which increase or decrease the flame intensity, (7) Gas Pipe – which convey the gas generated from the reactor to the burner, and (8) Chimney – which discharges unwanted gases .

Firing of Fuel Reactor

The fuel reactor (40 cm diameter) can be placed outside the cooking area while the burner (30 cm diameter) can be placed inside, for much cleaner operation. Unwanted gases can be discharged through a chimney (2 in. ϕ pipe) that can be extended through the roof.

Flammable gas, primarily of carbon monoxide and hydrogen are produced during operation as the burning fuel moves down the reactor. The by-product after gasification is a good source of carbonized rice husk as material for crop production. .

Bluish Color Flame from the Burners

The stove consumes 14 kilograms of rice husk per load within 50 to 55 minutes continuous operation. The energy input for the blower is 22 watts at 220 volt line. The specific gasification rate is 142 to 145 kg/hr-m^2 while the combustion zone rate is 2 to 2.5 cm/min. Start-up time for rice husk is 1 minute while the time to produce combustible gases is also a minute. Two 10-liter of water can be boiled in the stove within 18 to 23 minutes. The advantage features of the stove are as follows: (1) Easy to start with almost no smoke at all, (2) Convenient to operate by using gate valves and switch knob to control the flame, (3) Clean to operate with no fly ashes, (4) Low operating cost since it uses rice husk as fuel and minimal amount of electricity, and (5) the by-product after gasification is a carbonized rice husk (30% of rice husk weight) which is a good material as soil conditioner.

The investment cost for the stove is P40,500.00 per unit (two-burner model) and the computed cost per 6-hour day operation is P117.00 (1 USD = 55 PHP). A savings of P173,374.32 per year can be realized compared with 50-kg LPG large size stove. Three or more burner models can also be made but of relatively higher in cost.

The technology is now in commercialization stage. Interested organizations to adopt this technology may contact the Project Director, Appropriate Technology Center, Department of Agricultural Engineering and Environmental Management, College of Agriculture Central Philippine University, Iloilo City, Philippines. Telephone number 063-33-3291971 loc 1071, email ad atbelonio@yahoo.com, and mobile phone 063-0916-7115222