



Resource Efficient Agricultural Production (REAP) - Canada CANADA



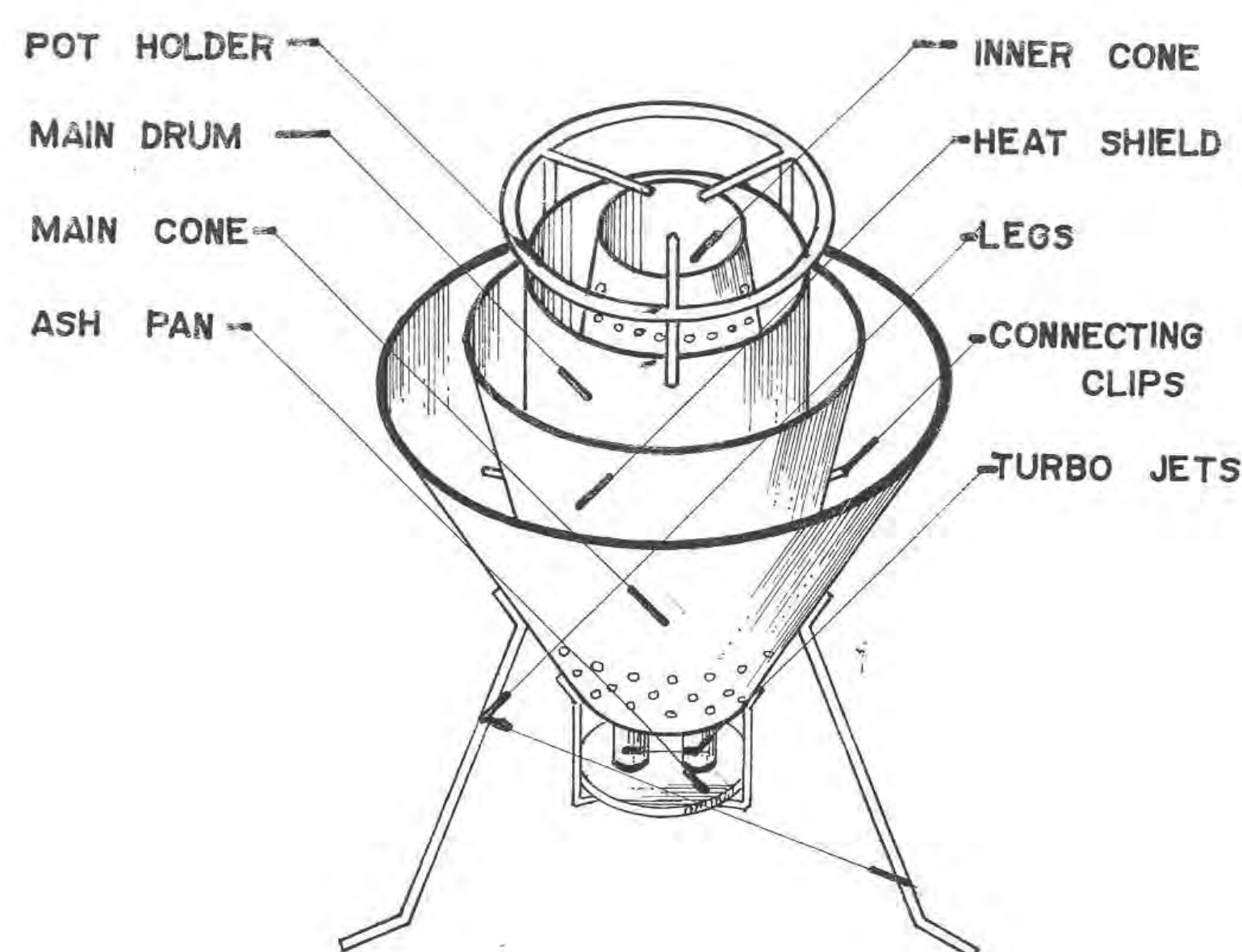
Organizational Description

REAP-Canada was established in 1986 as an independent, not-for-profit organization specializing in biomass energy and agro-ecological farming systems research and development. For the past 15 years, REAP-Canada has been working internationally with community based organizations, research scientists and rural communities to develop innovative new approaches for agro-ecological farming and household cooking systems.

In response to deforestation for household energy needs in the Philippines, REAP-Canada developed a clean combustion conical rice hull stove called the Mayon Turbo in 2001. At the time, it was the first non-fan assisted biomass stove to produce a clean burning blue flame in the world. Over 10,000 Mayon Turbo Stoves have now been built and distributed in Southeast Asia and West Africa. In 2011, REAP-Canada designed the REAP Clay Brick Stove as a response to the West African community demands for a clean-burning, low-cost, wood-burning stove for rural areas. By the end of 2013, REAP-Canada will have built 2,000 of these new innovative stoves in communities in Senegal and the Gambia (please see REAP Clay Brick Stove under African cookstoves).



Filipino users with the Mayon Turbo rice hull stove



Mayon Turbo Stove Design

Project Overview: Mayon Turbo Stove

Inspired by the Mayon volcano in the Philippines, the Mayon Turbo Stove (MTS) has a near 'perfect' cone design that allows the clean, efficient, and convenient combustion of crop residues produced by milling the world's most important food crop: rice. Low-income rural families can now utilize surplus rice hulls found throughout much of the developing world as a clean burning and low cost cooking fuel alternative. For \$15-\$20 USD per cooker, impoverished families are gaining access to this new stove to reduce their household cooking expenses and to improve indoor air quality.

Over the past few years, 10,000 rice hull stoves have been distributed in Southeast Asia and West Africa by REAP-Canada and their local partners. REAP is now stepping up efforts to introduce this simple technology internationally and offering the stove design through a stove producer production kit.

Results

Lab results: compared to 3-stone open fire

Reduction in particulate matter (PM) emissions	70.1%
Reduction in CO emissions	24.5%
Reduction in time to boil	17.1%

The MTS was found to have an overall thermal efficiency of 27.5% which makes it about twice as efficient as the 3-stone open fire which has a thermal efficiency of 13.9%.



Non-fan assisted clean combustion blue flame of the Mayon Turbo Stove

Field results

After its introduction into rural Philippine households, the MTS displaced 73% of the energy used for household cooking. Overall, the average MTS stove was found to save 1734 kg of firewood, 54 kg charcoal and 7.2 kg LPG per year in fuel. This was equivalent to reductions of 73%, 76% and 46% respectively for these aforementioned fuels.

What are the main advantages of using the Mayon Turbo rice hull stove?

Less smoke emissions	81%
Heats up quickly	81%
Low fuel cost	79%

Source: Philippines Agricultural Climate Change Project: (REAP) - Canada. March 2003. Available at www.reap-canada.com

Future Plans

Since 2001, REAP-Canada has developed three different sized versions of the MTS to provide a heat output with rice hull to match family sizes. The MTS 6500 is suited for a family of 6 or less, the MTS 7000 for a family of 6-9 and the MTS 7500 for a family size of 9-12.

REAP-Canada is currently marketing an international stove package for workshops to produce the stove which can be purchased for \$200. It provides detailed line drawings on producing the various components of the stove and instructions for its assembly. In addition, it provides tips to stove manufacturers on the important points of quality control and streamlining production. The kit also provides instructions for stove use. Our main efforts now are to optimize the stove to use other agrifuels such as groundnut shell and millet husk in Africa.



Distribution of the Mayon Turbo Stove

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