

PORTABLE EMISSION MEASUREMENT SYSTEM (PEMS) FOR FIELD TESTING OF COOKSTOVES

BACKGROUND

Traditional solid-fuel cookstoves, or 'chulhas', are known to be a source of air pollutants. Nevertheless, these chulhas are used by a large number of rural households in developing countries. Efforts to improve the energy efficiency and reduce emissions are reported in several studies. Literature survey and experience also point to large deviations in emission levels when measured in the lab and compared with the field results. This is largely because of the influence of stove operations and the extent of control on air supply during cooking. The current cook-stove testing facilities set up by the Ministry of New and Renewable Energy (MNRE), Government of India, are equipped for laboratory testing based on certain test/certification protocols.

ABOUT THE PROJECT

CLEAN intends to extend this effort by procuring a portable emission measurement system (PEMS), which follows international norms. The set-up is usable for testing under actual field conditions. The equipment would make it possible to provide emission data that are consistent with other similar efforts across the world. This has been a long-standing demand of the practitioners. The results from the MNRE-approved labs were not giving data but just a qualifier that the stove has cleared the benchmark or not.

PEMS would help practitioners in understanding the extent of deviation in data between the lab and the field. The data could thus be used as inputs for technology modification or even recommendation of ventilation to make the kitchens safer. It could also, perhaps, strengthen practitioners' fund-raising efforts with more reliable data.

PROJECT PARTNER

CLEAN is collaborating with IIT-Bombay on capacity building of CLEAN team for the operation of the equipment. IIT-

Bombay also have procured a similar equipment for testing of cookstoves in the laboratory the equipment procured by CLEAN will be used in field testing in Indian condition.

DETAILS ABOUT PORTABLE EMISSION MEASUREMENT SYSTEM

Aprovecha Research Centre has developed a PEMS to provide stove projects with a simple, effective, and less expensive emission hood for on-field emissions data collection and measurement. It is a stove laboratory that can be carried as airplane luggage.

The PEMS consists of:

- Light-weight hood structure
- Blower and flow measurement system
- Sampling system for emissions
- Real time data acquisition system
- Logging and analysis software

SALIENT FEATURES OF PEMS

1. Real-time data of emission level through PEMS
2. The data of carbon dioxide and particulate matter emissions released during a cooking task
3. Real-time analysis of specific emission, emission factors, and pollutant/carbon monoxide ratios



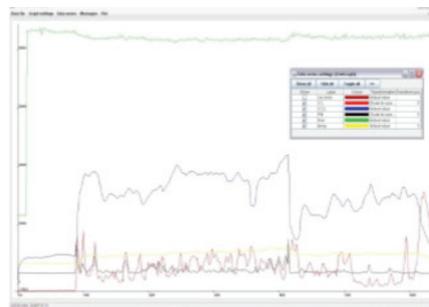
PEMS sensor box and computer



PEMS hood in use



PEMS sensor box, laptop and hood in cases



Live graphical readout

BENEFITS TO CLEAN COOKING FRATERNITY

1. Emission measurement data can help CLEAN members to get valuable feedback for design improvement in their cook-stove technology
2. Data will also help to track the health impacts through cook-stove technology

Partners:



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