

Use of biomass in industrial boilers in the Mekong region

In view of increasing oil prices, biomass has been emerging as an important alternative energy source in Asia. Mekong region countries, which are predominantly agriculture based, produce abundant quantities of biomass and there is huge potential to tap this energy source. A regional training workshop, held 17–21 July with 17 delegates in Bangkok, was organized by the APO and Thailand Productivity Institute as part of a project sponsored by the ASEAN Foundation for the promotion of biomass use in industrial boilers in place of fossil fuels in Thailand, Cambodia, Vietnam, Lao PDR, and Myanmar. Two experts from Japan and Malaysia who were part of preparatory missions for preliminary assessments of biomass boilers in those countries in March 2006 were deputed to coordinate discussions and train participants.

The workshop emphasized that it is important for small and medium-scale industries (SMIs) to switch to biomass-based boilers, which are cost-effective and stabilize CO₂ emissions. Rice husk, corn waste, palm waste, wood chips, bagasse, sugarcane waste, wood waste, and organic solid waste are the major types of biomass produced in Mekong region countries. There are various technology options for the use of biomass, such as direct combustion, gasification, fermentation, and anaerobic digestion, to produce energy. It can also be processed and converted into pellets, called refuse-derived fuel, to feed into boilers. The effective heating value of biomass depends upon its type and water content, but ranges from 5 to 20 MJ/kg.

SMIs in the Mekong region mainly use fire-tube and water-tube boilers and these can be easily retrofitted into biomass boilers. However, depending upon boiler configuration, such retrofitting may result in a capacity reduction as great as 50%. Despite the reduction, biomass boilers are more cost-effective due to the availability of biomass at significantly cheaper rates than fossil fuels. The cost economics estimated as group work by the participants, at variable and fixed costs, showed a favorable internal rate of return, indicating the economic feasibility of biomass boiler use.

In the workshop, problems that can limit the use of biomass were identified and discussed. They included constant year-round availability of specific biomass, transportation of biomass, requisite storage space, and availability of small-capacity



Observing a biomass boiler prototype at M/s Thai K Boiler

biomass boilers and retrofitting expertise. An integrated approach by the government and private sector is thus required to develop policy measures and infrastructure, respectively.

During the workshop, a field visit was organized to M/s Thai K Boiler, which manufactures biomass boilers and has retrofitting capabilities. The field visit demonstrated the simplicity of biomass boilers, and participants were subsequently able to observe one in operation at M/s P M Textile Company. That company retrofitted its oil-fired boiler into a biomass boiler and achieved significant cost savings using palm nut shells as a fuel source.

A basic training manual on biomass boilers developed by the experts was examined during the workshop to finalize it. This will be followed by the creation of a Web-based portal and the organization of national workshops in each participating country to conclude this project. 🌀