

## **Report on training on “Bamboo based gasification system” held at CGPL from 28/2/05 to 4/3/05.**

Bamboo flowering and eventual death of the species in the coming seasons will make available large scale bamboo residues. This has to be utilized continuously and on large scale so that the residues are consumed quickly after generation and there will be no storing leading to other menaces. National Mission on Bamboo Applications (NMBA) has been specially created by TIFAC to address the issue of value addition of these residues. One such application conceived by NMBA is distributed power generation through bamboo gasification and further value addition of the residues. Several project proposals were made for gasifier applications in the North Eastern region of the country where large scale bamboo flowering are to occur.

A training program was organized jointly by ABETS, CGPL, IISc and NMBA to benefit potential industries. The training program was held in CGPL, IISc, Bangalore. NMBA identified industries and also supported the travel costs of the participants. The local hospitality was taken care by CGPL as a part of the project from NMBA.

The training program was for a week between 28/2/05 to 4/3/05 including class room sessions, laboratory sessions and a field visit. The course work was designed to introduce all the aspects of running a gasification based power plant.

The participants were provided with a kit containing course material, biomass to energy book which condenses 2 decades of experience gained by the laboratory in this field, a writing pad etc.

The training began on Monday, the 28<sup>th</sup> of February at 9:30am at the conference hall of CGPL. The first session had a welcome to the participants and familiarization of participants and the speakers. In the next session, various technological routes that were available for converting biomass to energy were discussed. The participants got an idea of which route to follow for energy generation for a given biomass under specific circumstances. In the second session, the science and technology of gasification in particular was discussed. In the third session the speaker introduced the field systems and its applications to the participants. In the first laboratory session, the participants were taken around the laboratory; the 1 kg/hr gasification system along with the gas engine was demonstrated. Also biomass stoves were demonstrated.

In the next day class room sessions, the participants were introduced to the aspects of fuel preparations including sizing and drying, water treatment requirement to enable the water to be used in recirculating mode for the gasifier and discharge to meet the norms of the pollution control board. In the next session the power generation from producer gas was dealt where in the developments for using the gas in producer gas alone mode was predominantly dealt. In the last class room session for the day, the biomass resource assessment aspects and the special effort taken by the lab to create a biomass resource atlas for the country was discussed. In the second laboratory session, the participants were introduced to the working of the various biomass sizing and processing equipments. Later the participants had the hands on working on a 5 k/hr gasifier system. All the participants were made to start-up and shut-down the system.

During the next days class room session, the participants got an overview of the other gasification system and research at other places in the world. Later byproducts from

gasification and economics of gasifier operations were addressed. In the third laboratory session the participants operated the 5 kg/hr system with the engine and operated the 80 kg/hr gasification system in burner mode.

During the fourth day the participants were taken to Sultanpet near Coimbatore in Tamilnadu for seeing the 1 MWe system at Arashi Hi-tech Bio-power system in operation.

In the final day, the participants had an open session where they could express their views and doubts and get clarifications.

In the final session, the participants were given a CD containing all the presentation and a certificate of their participation in the program with a group photograph taken earlier. The workshop concluded with vote of thanks.

The appendix-1 gives the timetable of the training program, appendix – 2 gives the final list of participants and appendix – 3 the group photograph.

## **Appendix – 2**

### **Final List of the participants for the Training Programme**

1. Abdur Razzaque
2. Amod Kumar
3. Suprakash Jamatia
4. K. Kapfo
5. P.K. Roy
6. Kanwaljit Singh Gill
7. Ramavtar
8. Gauri Shanker
9. Raman Deshpande
10. Pratap Goswami
11. D.V.S.S. Ramprasad
12. Amit Kumar
13. Hemendra Kumar Nath
14. Pradyumna Kumar Choudhury

## Appendix - 1 Training program schedule

	9:30 AM to 10:30 AM	10:30 AM to 11:30 AM	11:30 AM to 12:30 PM	<b>L u n c h  B r e a k</b>	2 PM to 3 PM	3 PM to 4 PM	4 PM to 5 PM
Monday, 28-2-2005	Introduction to the course and overview	Technology Routes for Biomass Conversion	Gasification technology		Gasifier applications	Lab -1	
Tuesday, 1-3-2005	Aspects of fuel preparation	Water treatment	Power generation from producer gas		Biomass Assessment	Lab 2	
Wednesday, 2-3-2005	Overview of gasification systems		Byproducts from gasification		Economics of gasifier operations	Lab 3	
Thursday, 3-3-2005	Field visit to Arashi Hi-tech Bio-power, Sulatnpet, Coimbatore						
Friday, 4-3-2005	Presentation by the participants		Concluding Remarks				

### Appendix -3



**NMBA Sponsored Training Program on Biomass Gasification Technology  
at CGPL, Indian Institute of Science, Bangalore  
28<sup>th</sup> Feb - 04<sup>th</sup> Mar 2005**