

SEMINAR ON
DEVELOPMENT AND UTILIZATION OF BIOMASS
ENERGY IN PAKISTAN
(REPORT)



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A seminar on Biomass Energy “Development and Utilization of Biomass Energy in Pakistan” was held on 12th June 2015 at COMSATS Institute of Information Technology (CIIT) Lahore Campus. The seminar was attended by renowned experts from industry and academia.

The proceedings of seminar were initiated with the recitation of Holy Quran. Mr Khalid Saeed, Head Energy Research Centre (ERC), CIIT Lahore, welcomed the participants and briefly explained the prevailing energy crisis in Pakistan, importance and role of biomass energy in power generation and mitigation of energy crisis, need for efficient governance, and objectives of the seminar.

Biomass experts gave talks and presentations on specific topics related to biomass energy as detailed below. The participants deliberated on biomass resource potential and technology (s), issues in biomass collection, treatment and transportation and utilization at biomass power plants.

Expert Name	Title of Presentation /Talk
Dr Muhammad Ghaffar Doggar, Energy Research Center, CIIT Lahore.	Biomass energy utilization in Pakistan, China and Indian
Dr Muhammad Iqbal, Faculty of Agriculture Engineering and Technology, Agriculture University Faisalabad	Biomass issues in collection, treatment and its supply from farmers field to biomass power plant and cost implications
Dr Arifa Tahir, Head, Department of Environmental Sciences, Lahore College for Women University, Lahore.	Environmental implications of biomass combustion

Dr Moinuddin Ghouri, Chemical Engineering Department, CIIT Lahore.	Biomass gasification energy
Iftikhar Ahmad Randhawa, Chief Engineer (Power), Energy Department, Lahore	Opportunities for biomass power generation in Punjab
Mr Qamar Abbass, Biomass Engineer, Nishaat Textile Mills (Biomass power plant) Lahore	General talk - Nishat Biomass power plants – lessons learned
Mr Khalid Javaid, CEO / Biomass Engineer, OMS Solutions (Private Industry), Lahore.	General talk - Biomass sustainable energy
Dr Tariq Ijaz, CEO Engineering Development Board, Islamabad	General talk - Issues in biomass technology(s)

Detail of discussions and presentations given by biomass experts are summarized below:

1. Dr Ghaffar delivered lecture in the form of a presentation on status of biomass energy resources and technologies used for power generation in Pakistan. He also presented data on biomass power generation, including the incentives given in the form of subsidy(s) and tax exemptions and lessons learned, in Pakistan, China and India. He proposed that biomass combustion technologies are technically efficient and may be adopted for power generation in Pakistan. He also recommended to grant financial incentives to plant operators and encourage biomass power generation in Pakistan. It was also recommended to conduct comprehensive survey to assess the true biomass resource base as the available data is just an estimation.
2. Dr Muhammad Iqbal highlighted the issues in biomass collection and transportation including the costs involved. He recommended that biomass power plants may be installed in view of crops grown within 50 Km radius of plant site and after assessment of net biomass resource available so that there should be no shortage of biomass in future. He proposed that maximum size of plant of 5 MW may be installed as show case model and after learning its success failure - lessons, large size plants may be considered. He also proposed that collaboration may be developed between University of Agriculture Faisalabad (Department of Energy Systems) and CIIT Lahore (Energy Research Center) for knowledge sharing and joint research projects.
3. Dr Arifa explained environmental implications of crops residue burning in field. She told that crops residue when left in fields improves the fertility of the soil as such its usage for energy would reduce the fertility of the soil. Expanded use of logging residue and live trees will affect forest structure and nutrient cycling. It was indicated that by burning one Kg of crop

residue or wood, injurious gases are produced including carbon monoxide (130 g), hydrocarbons (51 g), fine particulates (21 g), highly carcinogenic poly cyclic organic hydrocarbons (0.3 g), carcinogenic dioxins (10- 167 milli grams). Further, smoke is usually released near ground level in populated areas and thus is especially apt to hurt people. Wood burning pollution is often concentrated in certain areas and at specific times such as in the evening during winter seasons. Biomass smoke is generally heavier than air and tends to sink to the ground, and causes high concentrations of deadly particulate. It was proposed that environmental aspects may be taken into consideration while installing biomass plants.

4. Mr Iftikhar Ahmad Randhawa shared the biomass initiatives taken by Punjab Government. He proposed that plasma technology may also be considered for biomass power generation. He emphasized the need for regulatory frame work for installation of biomass power plants which should be framed and implemented by provincial governments. It was recommended that distance between power houses /plants should be 70 Km minimum. It was also informed that Punjab Government is developing a framework on this subject. Mr Randhawa also proposed that COMSATS may collaborate with the Energy Research Center, established by Punjab Government at Engineering University Kala Shah Kakoo Campus for which an MoU may be signed. This was appreciated by the chair. It was also proposed that COMSATS may select a village and develop a project to exploit renewable energy resources and supply energy required for cooking, lighting and commercial etc. by the community. This will serve as a show case model to others to follow.
5. Mr Qamar Abbass explained experience of operation of 12 MW biomass power generations by Nishaat Textile Mills. The plant has been installed in the vicinity of Nishat Textile mills 20 KM from Lahore. He informed that 6 MW electricity is used for operation of textile mills equipment while 6 MW as process heat textile mill i.e. drying, finishing and dyeing etc. He pointed out that supply of biomass is a big challenge as middle men charge more money for biomass supply and further, they are also involved in adulteration and corruption that caused loss to boiler and plant equipment. Due to adulteration in biomass supply, coal is being used for power generation and no such problems are faced.
6. Dr Tariq Ijaz shared his experience on biomass technologies and proposed that show case model of biomass power plant should be installed and after establishing biomass supply chain systems at rational costs, decisions may be made for installation of large size plants. He also recommended fire safety system must be strong enough at storage of biomass plant site.

He also offered to collaborate on research projects and its funding provided that the projects are selected in consultation with Engineering Development Board.

7. Mr. Khalid Javaid shared his experience of biomass power generation from sugarcane bagasse. He told that sugar cane is one of the most promising agricultural sources of biomass energy in Pakistan. Bagasse is often used as a primary fuel source for sugar mills when burned in quantity; it produces sufficient heat and electrical energy to supply all the needs of a typical Sugar mill, with energy to spare. He said that most mills in Pakistan produce Bagasse of 48% moisture content, and most boilers are designed to burn Bagasse at around 50% moisture. For every 100 tons of Sugarcane crushed, a sugar factory produces nearly 30 tons of wet Bagasse. Thus there is huge biomass power generation potential in Pakistan. The Government should encourage private sector to exploit bagasse for power generation. He appreciated the recommendations of experts for biomass power generation in Pakistan.
8. Dr Zakir reviewed the biomass technologies and recommended biomass gasification for power generation which was however, disagreed by other participants of meeting. He also discussed the environmental implications of technologies and costs analysis.

After detailed deliberations the following recommendations were made by the house:

1. A comprehensive survey to assess the true biomass resource base in Pakistan may be conducted by provincial governments since the available data is just an estimation and total resource potential, local consumption and net available for biomass power generation is to be authenticated.
2. Biomass combustion technologies are technically efficient and economical and may be adopted for power generation in Pakistan.
3. Biomass power plant of combustion type, may be installed as show case model with the capacity of 5 MW. After studying its operational performance along with capacity building of manpower, operators, end users and biomass suppliers/ farmers, large size biomass power plants may be installed by private sector.
4. Suitable size of biomass combustion plants may be installed in respective cropping zones and care must be taken to ensure supply of required crops biomass to plants.
5. Subsidy based biomass collection, treatment and transportation machinery and equipment may be provided to farmers with full R&M support. Minimum subsidy should be (50%) of the cost of machinery and equipment.

6. Trainings should be provided to machinery operators and farmers for biomass collection and supply. There should be no middle man involved in purchase of biomass by plant owners and farmers may sell crops biomass directly to plant owners.
7. There should be regulatory frame work to maintain distance between location of plants depending upon its size so that there is no shortage in crops biomass supply and its price escalations.
8. Biomass in the form of briquettes/pellets may also be provided after treatment by farmers at farm level. This will reduce the transportation costs and will add value to biomass fuel.
9. Environmental loss due to burning of crops residues in field must be prohibited through regulations by provincial governments. Further, environment aspects of plants may be considered and rectifications be made on each plant to make environment safe.
10. Collaboration on energy R&D, technology development and its commercialization between all stake holders especially Research, Academia, Industry and private sector must be developed in letter and spirits.
11. MoUs may be signed with Agriculture University Faisalabad, Punjab Energy Department Energy Center (CERAD), Engineering Development Board for technology sharing, joint R&D projects and funds provisions etc.
12. The CIIT Lahore campus may select a village and develop a project to exploit renewable energy resources and supply energy for cooking, lighting and for other commercial requirements in a model village as proposed by representative of Energy Department.
13. The research labs may be strengthened to conduct research on biomass energy and develop and adapt advanced technologies in this field as and when required.

Picture Gallery



