

Online Capacity Building of Professionals from Member State Bhutan on Commercial Scale Biogas Plants

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Prof Arun Kumar is a civil engineer with specialization in water resources and hydropower engineering by education is working at Department of Hydro and Renewable Energy, Indian institute of Technology, Roorkee since 1981. He has been awarded MNRE Chair Professor (Renewable Energy) in July 2013 and again in April 2015 by IIT Roorkee. He served as independent director on Board of NHPC Ltd, Govt of India PSU during 2015-2019. His research areas are Hydropower Development, Environmental Management of Water Bodies, Energy Economics and Policy. Prof. Kumar has over 39 years of experience in the field of Hydropower and environmental management of river and lakes. He served CLA for Hydropower on SRREN for IPCC. Currently he in Vice President of Federation of Indian small hydropower. He is Bachelors in civil engineering and PhD in hydropower from IIT Roorkee, Masters in Civil Engineering from IISc Bengaluru and Hydropower Diploma studies from NTH, Norway. He is Fellow of ASCE, International association of Hydropower, Institution of engineers (India), IWRS. He was appointed as Coordinating Lead Author (chapter 5 on Hydropower) for preparing Special Report on Renewable Energy Sources (SRREN) for IPCC – working group III during 2009–11. He has been involved as international expert in various UN sponsored projects on assessment of small hydropower and Capacity Building in Zambia, Sierra Leone, Tanzania, Cambodia, Sudan and Indonesia.



Prof. Sanjeev Kumar Started his career in biogas technology in 2009-10 under Biogas Development and Training Centre, (MNRE) Uttarakhand as Sr. Research Fellow. During the tenure, he was involved in the filed level survey, training to professionals and research work related to biogas technology implantation in the state of Uttarakhand and part of Uttar Pradesh. He then moved to IIT Delhi in 2011 for Ph.D. from Centre for rural Development at IIT Delhi. During his PhD, he worked in close association with the BDTC IIT Delhi in the area of biogas technology. Since 2011, Prof. Sanjeev in researching the biogas production from algal biomass and cattle dung. He recently completed a one-year-long pilot-scale testing of algal-cattle dung based biogas plant at IIT Delhi. At IIT Roorkee, he is guiding research scholar for improving the biogas production algal biomass with various technological interventions. Valorization of the bio-manure obtained from biogas plants for different applications is another central theme of his current research. In September 2020, he was acted as a member of the team formulated by IIT Roorkee for technical inspection of cattle dung based bio-CNG plant situated in Haridwar district. Besides, he is also leading the formulation of a research and development project to improve the commercial and technical viability of the bio-CNG plants based on locally available different feedstock. He has published several high-quality research articles on biogas production from algal and cattle dung biomass along with the biomass pretreatment for high methane yield.



Prof. Pratham Arora is currently an Assistant Professor, Department of Hydro and Renewable Energy, IIT Roorkee. Prior to joining IIT Roorkee, he was a Post-doctoral fellow at the Georgia Tech., Atlanta in the Industrial and Systems Engineering Department. At Georgia Tech., his research was focused on process optimization, techno-enviro-economic analysis and life cycle assessment (LCA) of algal biofuels, syngas fermentation, solar

fertilizers and direct air capture systems. He was working in collaboration with highly innovative sustainable fuels companies such as Algenol biofuels, Lanzatech and Global Thermostat. Dr. Arora has completed his doctorate from IITB-Monash Research Academy – a joint venture between IIT-Bombay, India and, Monash University, Australia. His thesis was entitled “Techno-enviro-economic evaluation of ammonia production from biomass gasification using multi-scale modelling.” The project was funded by Orica Mining Ltd. His Ph.D. thesis quantified the effect of biomass composition, process configuration, the supply chain, and the national economic and environmental scenario on the life cycle costing and LCA of the biomass-to-ammonia process. Such an analysis is expected to provide the decision makers with consistent and comparable data to objectively judge the viability of any renewable energy technology. This work has been published in high quality journals including Industrial and Engineering Chemistry Research, Journal of Cleaner Production, and Chemical Engineering Research and Design. His research has also been awarded as the best collaboration by the IITB-Monash Research Academy. Presently, he is extending this research to production of different sustainable fuels and chemicals.



Prof. Deepak Sharma Prof. Deepak Sharma worked as Professor in the Department of Renewable Energy Engineering, College of Technology and Engineering, Udaipur (Rajasthan). He has 38 years’ experience of teaching as well as conducting research & extension activities in the field of New and Renewable Energy Sources particularly small and large capacity biogas plant installation and commissioning. Prof. Sharma is recently nominated as Expert Member in the National New Biogas Plant Appraisal and Evaluation Committee (NBPEAC) constituted by the Hon’ble Minister, Ministry of New & Renewable Energy, Government of India. He has guided 8 Ph. D. scholars, 22 M Tech students and more than 45 B Tech students as Major Advisor. Dr Sharma is Divisional Editor for Journal of Agricultural Engineers (Energy and other Areas Division) published by Indian Society of Agricultural Engineers, New Delhi.



Mr. Srinivas Kasulla After achieving the merit rank in his post-graduation in Environmental studies, Srinivas Kasulla is active in working with NGO’s as well as private institutions on waste management as well as on Biogas plant installations. Following his successful work he was appointed as the core team member in top Biogas companies from India where he has been responsible for the whole project management, as well as execution of construction, installation work and biological commissioning since 2004. In addition, Srinivas is instrumental and taking responsibility for biogas development in Indian Market. Srinivas has worked as Vice President for leading biogas companies in India. At present Srinivas is working as an independent consultant on waste to biogas projects where he has extended his sphere of responsibility as an overall project developer. Srinivas was instrumental in designing, installing and commissioning more than 150 biogas plants across the country.



Dr. Atma Ram Shukla superannuated as Adviser (Bio-energy), in the pay scale of Joint Secretary, from the Ministry of New and Renewable Energy, Government of India, New Delhi in September 2011 after working for about twenty-nine years. In all, he has about forty-two years of experience in policy, planning and developing RD&D projects on Renewable energies at National level, devising dissemination programmes along with its implementation, development of standards, and involvement in country wide monitoring focused at reaching the last mile.



Mr Shailendra Shukla, a technocrat with excellent reputation in the field of Power-Energy, Bio-fuel & Rural Development; having decades of association and expertise in these fields. He was Director/CEO/MD/Chairman for about 20 years out of total service of 38 years. Last position held was Chairman – Western Region Power Companies and Chairman, Chhattisgarh State Power Companies. He was Chairman, Haryana State Renewable Energy Development Agency (HAREDA) and Director/CEO of Chhattisgarh State Renewable Energy Development Agency (CREDA) for 16 years. He had been a part of UNDP and UNEP funded multi country projects and visited more than 25 countries of the world. He had opportunity to lead a multi-activity flagship project on “Integrated Energy Management Master Plan for the Nation. The first kitchen-waste based cooking gas plant was established in CEAT factory, Gwalior on his concept & design. The same types of plants (on same design) were repeated in RPG transmission-Nagpur, BAJAJ-Pune, Hotel Rishi Regency-Jabalpur and Mourya-Sheraton-Delhi. He designed and set up a 2800 cum. Starch-waste based Bio-methanation plant for power generation at Rajnandgaon of Chhattisgarh in 2003, ever first project of its kind in India; running a gas engine of 350 KVA using methane. He designed and set up a 3TPD capacity trans-esterification plant for producing Bio-diesel at Raipur, Chhattisgarh in 2005; ever first project of its kind in India



Mr Chandan Gadgil is an Electrical Engineering from University of Mumbai India. He has been a serial entrepreneur having worked in the field of IT and Renewable energy (Large Biogas plants, Biogas power, Bio CNG). In 2012, after his company was bought out, he decided to give back to society in whatever way possible and to work in the development sector. In 2013 he joined BAIF Development and Research Foundation, Pune, India, as a Hon Advisor, Renewable energy. BAIF is a grass root Development NGO, established in 1967. He also is a founder trustee of an NGO called Sankalp Medi Education Society, Pune working to support new ideas like sustainable agriculture. He, together with BAIF Pune, has developed a low cost, compact and user friendly BAIF slurry filter (patent applied jointly with BAIF). for filtering Biogas slurry into slurry cake and liquid from family size biogas plants. As a part of Residue management, also developed a proprietary process to manufacture (BIOPROM) a value-added phosphate rich organic product from the slurry cake. BIOPROM can reduce/replace phosphatic chemical fertilisers, improve soil productivity and livelihood for the farmer. A special Bioinoculum (patent applied) used in the BIOPROM process is developed by him together with BAIF, Pune.