

Solar powered ESP can efficiently segregate incinerator flue gas

An engineering college in Chennai has developed a solar powered electrostatic precipitator (ESP) that can efficiently segregate particulate matter from flue gas of incinerated waste.

Professor K. Mohana Sundaram from Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Chennai with the support of Department of Science & Technology (DST) have developed a Needle plate ESP which can be run on solar power. It is compact and cost effective providing better gas flow rate as compared to conventional cylindrical model ESPs.

The team has used Needle- plate ESP type because it can treat higher gas flow rate than the presently used cylindrical model. It also provides better corona discharge-- electrical discharge brought on by the ionization of a fluid such as air surrounding a conductor that is electrically charged. The Electrostatic Precipitator is energized by 1000Wp Photo Voltaic (PV) array with static power converters and high voltage transformer-rectifier set.



The scientists have developed a prototype incinerator fitted with the ESP. They have treated the flue gases produced from municipal solid waste incinerator with the small experimental setup ESP. The obtained flue gas emission results demonstrate that concentration of Particulate Matter at ESP outlet is 28 mg/Nm³ & 31 mg/Nm³ (PM_{2.5} & PM₁₀) which are found to be less than the permissible Emission standards provided in the Bio-Medical Waste Management rule book which is 50mg/Nm³. The concentration at Pilot Scale ESP inlet and outlet was measured using Ecotech stack sampler and flue gas analyzer. The scientists say that the ESP can also be connected with a medical waste incinerator.

The team has tested the technology with photo voltaic modeling and the results were suitably validated. They plan to conduct testing of entire experimental setup on medical wastes as well as for all types of wastes in near future.

Hospitals, Health Centers, and Medical Colleges are the key target users of this technology which caters to the market demand for PV based medical waste incinerator utilizing renewable source as input.