PARTICULATE MATTER DISPERSION AT BIOMASS ENERGY PLANT USING AERMOD ATMOSPHERIC DISPERSION MODELLING: A CASE STUDY

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Abstract:
Biomass is included as one of the conventional sources other than solar and hydro energy. There are different types of biomass such as empty fruit bunch (EFB), fronds, mesocarp fibre (MF), trunk and shell. Each type provides a different level of particulate matter. The particulate matter had already emerged as one of the most critical pollutants. The dispersion of the particulate is studied at Bioenergy plant located at Jengka, Pahang which generates electricity from the EFB waste. The shredded EFB had produced abundant of dust and particulate matter which suspends in the air and deteriorating the air quality. Thus, the dispersion of particulate matter pollutant by the biomass power plant is a rising concern. The main purpose of this paper is to identify the critical location on-site and to measure and analyse the particulate matter dispersion by using AERMOD Modelling. This paper presents a simulation study of particulate matter dispersion at biomass energy plant. The influence of other operating variables was studied (temperature, relative humidity, wind speed, wind direction and activity). This paper also compares the concentration of PM2.5 and PM10 disperse from a location that had been marked as critical. From the result, the average concentration of PM2.5 and PM10 are 0.9724 mg/m3 and 0.9030 mg/m3. Based on the guidelines provided by the World Health Organization (WHO), the concentration of both PM2.5 and PM10 are exceeding the level of 24 hour mean of emission and can be concluded as critical.

Keywords: : Biomass; Renewable Energy; Particulate Matter; AERMOD

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