

## **TOWARDS ZERO EMISSION CONCEPT: Utilization of Palm Oil Mills Fly Ash for Treatment Different Industrial Wastes**

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Zero emission could be defined as using resources effectively and prevent resources depletion, or activities that are being carried out to curb waste generation, reduce emissions, in order to achieve the maximum usage of wastes through loop recycling. To clarify this point, focusing will be paid to palm oil industry and its significant environmental impact.

At present, Malaysia accounts for an overwhelming contribution to world's palm oil production and export which is 39% and 44%, respectively. The Malaysian Palm Oil Board (MPOB) expects production to climb to 20.5 million tons in 2018 from 19.9 million tons in 2017.

Biomass which is produced from the oil palm industries include oil palm trunks (OPT), oil palm fronds (OPF), empty fruit bunches (EFB) and palm pressed fibres (PPF), palm shells and palm oil mill effluent palm (POME). However, the presence of these oil palm wastes has created a major disposal problem. The fundamental principles of waste management are to minimize and recycle the waste, recover the energy and finally dispose the waste. One of the unique aspects of Malaysian renewable energy sources is that the palm oil mill is self-sufficient in energy, using PPF, EFB and shell as fuel to generate steam in waste-fuel boilers for processing, and power-generation with steam turbines.

Burning these wastes to produce energy usually accompanied by producing huge amount of waste-fuel boiler or flyash that creates a major disposal problem and Palm Oil Mills Effluent (POME) as a liquid wastes that cause a major source of aquatic pollution by depleting dissolved oxygen when discharged untreated into the water bodies.

Utilization of the fly ash as inorganic coagulant for treatment POME recently has been carried out in our Laboratory (TATI University College). Pilot plant scale also was used for assessment. Outcomes from this study was so positive that encourage us to propose full scale utilization.

Towards zero emission concept, the main objective of this proposal is to produce inorganic coagulant from flyash in large scale and use the product in real fields where POME is produced since POME. After treatment solidified wastes will be assessed as a fertilizer in palm oil farm since these wastes contain high nutrients such as P, K, N, Mg, and Ca.

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