

Towards Sustainable Palm Oil Production: Integrated D3PRO-POMEVap Solution for Minimizing Palm Oil Mill Effluent, Resource Recovery and GHG Reduction

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The aim of this work is to present Alfa Laval's integrated D3PRO-POMEVap solution to minimize Palm Oil Mill Effluent (POME), recover valuable by-products from POME and reduce Greenhouse gases (GHGs) emission. Traditional oil clarification system in palm oil mills involves dilution of pressed crude palm oil (CPO) with fresh water resulting in an increased POME. POME is characterized by high organic load and its treatment is a major challenge to most palm oil millers. Anerobic ponding system has been employed by several mills for treatment of POME. The ponding system, however, requires huge space; emits GHGs; and do not offer recovery of oil, water or nutrient-rich solids present in the POME. An efficient solution that can minimize the POME load and tackle POME sustainably is therefore necessary to achieve sustainable palm oil production. To this end, Alfa Laval has developed an integrated solution based on D3PRO and POMEVap technology. The D3PRO is an innovative process, and it involves undiluted oil clarification and purification process with a higher oil yield and at the same time reduce POME load by up to 30%. The POMEVap solution is based on AlfaFlash evaporation technology to separate POME into a clear water, oil, and a concentrate with nutrient-rich solids. The POMEVap offers several benefits: (i) recovered oil from POMEVap can be returned to oil clarification or it can be used as a HVO feedstock; (ii) the concentrate can be used as a fertilizer or animal feed; (iii) separated water can be re-used to achieve Zero Liquid Discharge (ZLD)); (iv) requires less space (example, just 300 m²); and (v) methane (GHGs) avoidance. In summary, the integrated D3PRO-POMEVap technology not only assists mills in achieving efficient clarification and purification of CPO but also helps in achieving their sustainability goals.

Keywords: Sustainability, Palm oil mills, D3PRO, Undiluted oil clarification, POMEVap, Palm oil mill effluent, POME, Oil recovery.