Source Waste Reduction: A Case Study on Waste Minimization at Beverage Services Kenya Limited (BSK)

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ABSTRACT

The extraordinary growth of waste globally is an indicator that creating waste, rather than reducing it is more popular. The amount of money spent in disposing of the waste generated, dwarfs the amount spent to reduce it. The reduction of waste generated at the source can be a solution to the current crisis facing most local municipalities and the country at large. Reduction of waste at the source provides avenues and management practices that ensure waste is minimized. This project has studied waste (solid and water) generated at Beverage Services Kenya Limited (BSK), a plant involved in the production of carbonated and non-carbonated products in polyethylene terephthalate (PET) and tetra package containers. To realize this goal, the entire process was divided into distinct units of operation based on the different processes in which the raw material inputs and the process outputs were evaluated to yield a material balance. The material balance indicated the efficiency of the entire process that involved handling and conversion of the raw materials to finished products. Synthesis of the material balance indicated processes with high inefficiencies resulting in high waste generation. Through a waste audit in the specific processes, corrective measures were devised to address the inefficiencies in six out of the fifteen process inputs identified. The implementation of the corrective measures in the six selected inputs resulted in a reduction of waste in the different processes. The preforms had a +0.6% improvement in yields equivalent to a annual savings of nine hundred thousand Kenya shillings. Sugar had a +0.25% yield improvement equivalent to one hundred thousand Kenya shillings savings. Strategic ingredients had a savings of half a million Kenya shillings equivalent to a +3.7% yield improvement. Water had a 3.8 million liters savings equivalent to slightly over half a million Kenya shillings savings. Carbon dioxide had a +14.1% yield improvement equivalent to over five hundred thousand Kenya shillings savings. The packs had a +5.5% yields

improvement equivalent to five million Kenya shillings savings. The result of the entire project was tabulated and analyzed using statistical process control (SPC) charts. At the end of the project, the waste treated outside the plant reduced from ten tonnes in January 2009 to three tonnes in the month of October and November 2009 translating into a 70% waste reduction. The project thus demonstrated that it is possible to reduce waste at the source in a small scale approach such as this case study done at BSK, hence can be extended to cover large scale options like municipalities and the country at large. The project at the end demonstrated the environmental and economic beneficial that can be realized.