

## **Computational fluid dynamics analysis of flatplate and v-grooved solar heat collector of different materials for plastic waste drying**

### **ABSTRACT**

Plastic waste pollution has become one of the most critical environmental issues in the recent years as it adversely affects the ecosystem in many ways. River has been reported for playing an important role in transporting plastic waste into the environment and continued efforts have been done to prevent, control, and treating plastic waste intending to support river conservation. In this present work, computational fluid dynamics (CFD) analysis was conducted to study the performance of solar heat collector (SHC) as a baseline study for the application of plastic drying at the post-treatment stage for recycling and upcycling of plastic waste. SHCs incorporated with different absorber configuration (flat and V-grooved) and absorber material (aluminum and copper) were tested in the aspect of heat transfer and fluid flow characteristics to identify the enhancement mechanism occurs in the collector. The findings indicate that SHC with V-grooved copper absorber exhibits highest collector efficiency (44.95%). However, the application of aluminum absorber would be sufficient for the case where low velocity drying process is performed.