

## **Abstract**

Hong Kong has approximately 600 temples, shrines, and monasteries. Elimination of smoke pollution from burning incense and diesel engines is a challenge. A self-cleaning wet electrostatic precipitator (WESP) is an important pollutant removal equipment and has great potential for greenhouse gas emission reduction. We investigate and enhance its performance by techniques of Computation Fluid Dynamics, charged water films, turbulence creation and hydrophilic coating. The watering system of the WESP is heavy and bulky, we plan to improve it by using vacuum air instead of water for clean purposes. Carbon will be captured and sequestrated in the collected fly ashes for carbon neutrality. The collected fly ashes will further be mixed with concrete to enhance its flow property and make it easier to pump in construction. However, the wastewater generated from the WESP process is considered hazardous due to high pollutant loads and cannot be treated efficiently using conventional treatment methods. We use supercritical water oxidation and bag filters to clean up the polluted water for recycling. The WESP will be used with air-handling units to combat airborne diseases on a large scale.