MCEF22002 Complete Report (01 September 2024 – 31 August 2025)

i) Project Title & Brief Description

Migration of a Novel Class of Organic Light-Emitting Materials (OLEMs) from E-waste to Finless Porpoises

The proposed project aims to determine the occurrences and distributions of a novel class of emerging organic contaminants related to electronic waste (e-waste), namely Organic Light-Emitting Materials (OLEMs), in finless porpoises living in the western Hong Kong and Pearl River Estuary (PRE) waters. OLEMs are essential substances utilized in electronic display screens manufactured, including those conventional OLEMs used in Liquid Crystal Display (LCD) panel, also known as Liquid Crystal Monomers (LCMs) and those unconventional ones used by Organic Light-Emitting Diode (OLED) panel, also known as OLED Monomers (OLEDMs). OLEMs are widely applied in smartphones, tablets, and large-screen televisions. OLEMs and other e-waste-associated chemicals can be released into the marine environment during the manufacture, usage, recycling, and disposal of these electronic devices (e-devices). OLEMs are predicted to be persistent, bioaccumulative, and toxic after entering the ecosystem. Herein, we propose this timely research to evaluate the current levels of OLEMs contamination and predict their migration patterns from e-waste to finless porpoises in the western Hong Kong and PRE waters. This study will assess the composition profiles of 76 commercialized OLEMs, including 62 LCMs and 14 OLEDMs in stranded corpses of finless porpoises collected from Hong Kong water and compare them with the actual OLEMs mixtures extracted from different e-devices obtained from the local market. This study will provide critical information for the preliminary assessment of the potential threat of OLEMs towards finless porpoises, as well as for the recycling, disposal, and management of e-wastes in Hong Kong, contributing to the conservation and enhancement of marine lives, particularly finless porpoises living in the PRE and Hong Kong waters.