

**Project Title: Self-cleaning eco-friendly advanced coating for steel corrosion prevention in marine infrastructures**

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**Project Outline:**

Corrosion of steel structures or steel reinforcement in concrete structures is a severe problem for infrastructures particularly when they are exposed to marine environments (i.e., chloride rich). Surface coating is a cost-effective solution for corrosion prevention purpose of such structures. This project is proposed to develop a new eco-friendly advanced coating system reinforced with two-dimensional materials/conducting polymer composites. This coating is expected to possess high cost performance, excellent corrosion resistance, excellent weather resistance, good self-cleaning performance as well as superior environmental friendliness. Extensive electrochemical approaches will be implemented to characterize the performance of the developed coating system. Upon the completion of the project, the corrosion resistance of existing waterborne coatings will be significantly improved so that they can be used to protect steel used in civil infrastructures and buildings and extend their service life especially for the high altitude, marine and other extreme environments. The research project meets a very important socioeconomic need in Hong Kong, the Greater Bay Area and other coastal regions of China. It also addresses an important mission of the CNERC, which is to support sustainable infrastructure development with foci on corrosion prevention and durability enhancement.

**Objectives:**

- To develop a novel waterborne coating enhanced by the graphene-like two-dimensional materials for heavy duty steel corrosion protection in severe marine environments.
- To characterize the anti-corrosion performance of the developed coating material using electrochemical methods.

**Expected deliverables:**

- A patent application for the developed protective coating material.
- A technical report and 2 journal publications arisen from the research activities.