

PRESS RELEASE

World leading air sensing technology with Unmanned Aerial Vehicle (UAV) for high Sulphur fuel screening and ship emission measurement

[HONG KONG] 30 Jan 2019: Institute for the Environment (HKUST-IENV) today showcased its world leading air sensing technology with its first Unmanned Aerial Vehicle (UAV) platform for high Sulphur fuel screening for ship emission measurement. This highly compact sensor package has the capability of measuring a wide range of pollutants – SO₂, NO, NO₂, CO, CO₂, and PM, and is designed to identify ships using high Sulphur fuel and violating the *Air Pollution Control (Fuel for Vessels)* Regulation, which became effective on 1 Jan 2019 and mandates all vessels to use compliant fuels within Hong Kong waters.

New regulations in PRD and Hong Kong waters effective 1 Jan 2019

Navigation has been the biggest source of air pollution in Hong Kong, contributing 49% of SO₂, 37% of NO_x, 38% of PM₁₀ and 44% of PM_{2.5} according to Environmental Protection Department's (EPD) 2016 Emission Inventory. With the increasingly stringent air quality objectives, control of local emission sources is becoming more important in order to improve air quality and to protect public health.

As a result, new regulations have been implemented from 1 Jan 2019 to control ship emissions in the Domestic Emission Control Areas (DECA) in PRD waters¹ as well as within the Hong Kong waters². In Hong Kong, ocean-going vessels (OGVs) that are using heavy fuel oil (with an average Sulphur content of 2.6%) are now required to switch to compliant fuel (equivalent to cleaner fuel with Sulphur content less than 0.5%) before entering Hong Kong waters.

Previous enforcement methods in Hong Kong and around the world mostly relied on examining vessels' fuel-use log-book, visual inspections on smoke opacities, or offline fuel sample analysis. To effectively enforce the regulations calls for a state-of-the-art innovation to generate real-time and reliable data to efficiently screen non-compliant ships.

¹ [Implementation Scheme of the Domestic Emission Control Areas for Atmospheric Pollution from Vessels](#) (30 Nov 2018)

² [Vessels required to use compliant fuel within Hong Kong waters from today](#) (1 Jan 2019)

UAV-based air sensing technology by HKUST-IENV

A research team led by Prof. Zhi NING and co-supervised by Prof. Jimmy FUNG and Prof. Alexis LAU from HKUST-IENV has been developing with the Hong Kong EPD on a proof-of-concept for an advanced real-time ship fuel Sulphur content (FSC) measurement using a UAV based sensor system. Facilitated by cloud-based real-time data communication and computing, the system is capable to measure the Fuel Sulphur content (FSC) ranging from 0.05 to 5.0% in 2 minutes after scanning the ship plumes in general operation distance of 50-meter away from the vessel.

The current UAV-based sensor system provides speedy, real-time and accurate screening solution for fuel sulfur content compliance screening which is less labor-intensive with significant improvement of enforcement efficiency.

IENV is grateful to see our scientific and technology innovations being used to support environmental policies and combating air pollution in a local and regional scale. We anticipate to develop more cutting-edge technologies for a cleaner environment and sustainable development.

DOWNLOAD PRESS MATERIALS:

<http://bit.ly/20190130-HKUST-IENV-PC>

ENQUIRIES:

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