

Detailed Description of Proposed Research:

Project: High frequency prediction of disaggregated marine shipping CO₂ emissions

Objective:

To develop a

Context:

Marine shipping is vital to global trade, carrying over 80% of the volume of all traded goods and around 70% of their value (?). The industry's importance has become particularly apparent in recent years as disruptions ranging from the blockage of the Suez Canal to widespread COVID-related port slowdowns have snarled supply chains world-wide. At the same time, shipping contributes roughly 3% of global CO₂ emissions, placing it roughly on par with the total emissions of Germany (?). These emissions lie outside the scope of national emissions tallies, and fall instead under the jurisdiction the International Maritime Organization, which has set a target of a 50% reduction by 2050. As an incremental step toward this target, efficiency standards are set to be implemented beginning in 2023, however the effects of these regulations are uncertain and widely debated. I aim to help inform this debate by constructing and estimating a model of entry, exit, and operational speed in dry bulk shipping in order to analyze the potential effects and effectiveness of emissions regulations.

Literature:

- ?:
 - <https://research.fleetmon.com/projects/emissionsea-extrapolation-of-emissions-from-ships/EmissionSEA> project
 - "validate reported emissions"
 - "The aim is to develop a methodology for the quantitative determination of CO₂ emissions from shipping."
- <https://www.ucl.ac.uk/bartlett/energy/news/2016/apr/co2-emissions-every-ship-every-hour-now-thats-big-data>UCL Energy Institute and methodology developed for the Third IMO GHG Study 2014
- ?
- ?

- ?
- ?, 2.2 IMO GHG report methodology

Contribution:

- first to use actual emissions rather than theoretical
- research tool
- inform policy makers, especially with incoming regulations

Methodology:

- data
- figures
 - fleet distribution
 - efficiency changes
- linear model - demonstrate progress for feasibility
- machine learning predictive model
- training?