The Data

Hourly Emissions for 100 container ships in 2019

IMO	TIME	SOG	LONG	LAT	E_CO2_kg
9762338	2019-02-15 07:00	18,08	6,51	53,86	19910,67
9632143	2019-10-16 04:00	19,00	109,28	9,01	15908,13

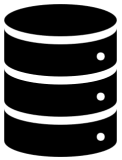
~900k entries

Exhaustive list of world ports

PORT_NAME	ISO 3	LONG	LAT
PALAMOS	ESP	3,13	41,84
CHERBOURG	FRA	-1,61	49,64

~8k entries

Continents by ISO 3



IMO	TIME	SOG	LONG	LAT	E_CO2_kg	PORTS_INDEX	CLOSEST_PORT	CONTINENT	DISTANCE	SHOREPOWER
9762338	2019-02-15 07:00	18	6,51	53,86	19910,6665					FALSE
9632143	2019-12-29 14:00	10	121,78	38,74	4136,3557	[1627]	DALIAN	Asia	23,96	FALSE
9619933	2019-07-05 18:00	0	120,26	35,99	0	[1625, 1844]	QINGDAO GANG	Asia	3,88	TRUE

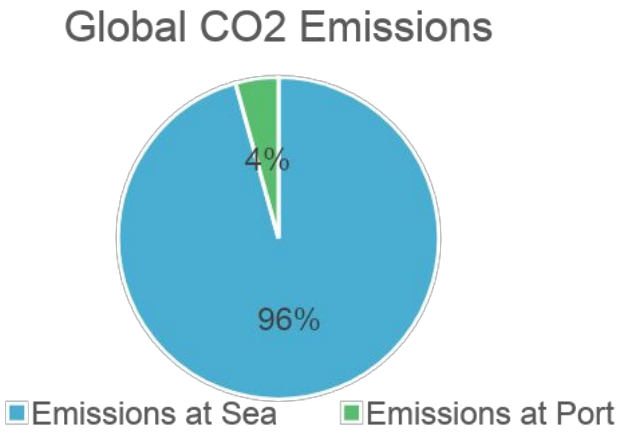
Filtering the port table
ship_long-0.3<port_long<ship_long+0.3
ship_lat-0.3<port_lat<ship_lat+0.3

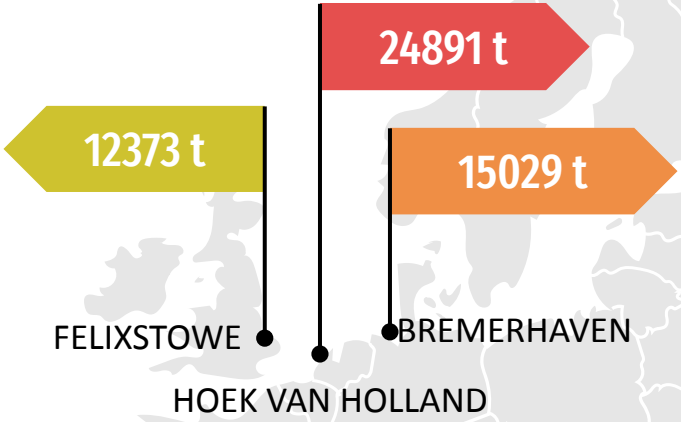
Using geodesic to calculate air distance from ship to port and selecting min(geodesic(ship,port))

Vlookup on ISO 3 from public data

IF(AND(SOG==0,E_CO2_kg==0,Continent != ''),TRUE,FALSE)

Emissions around European ports

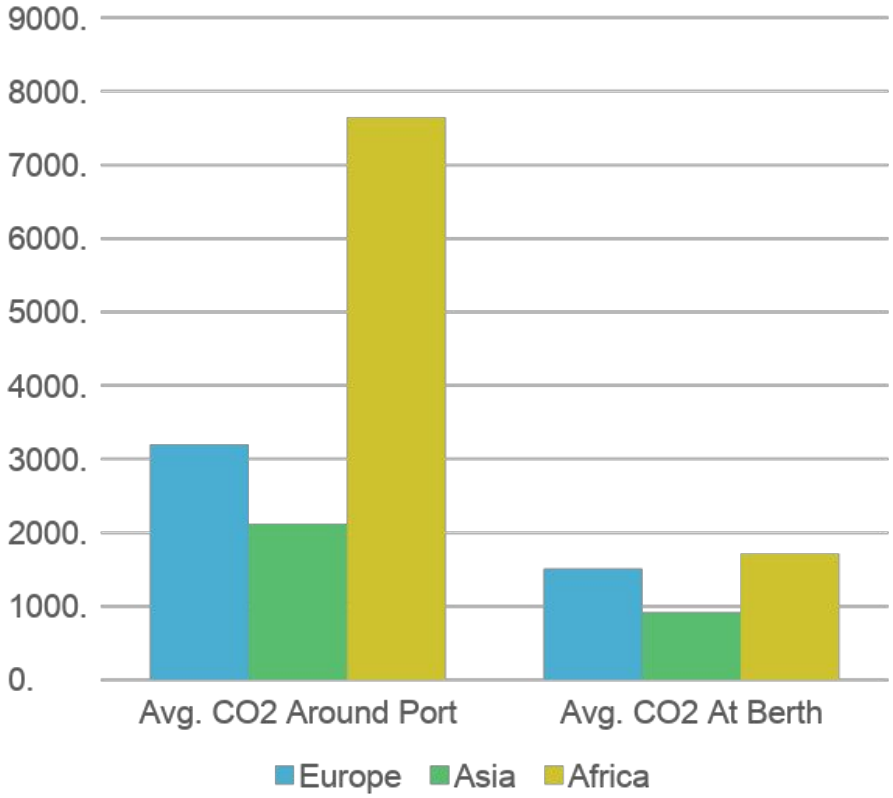




1.171 t Co2/hour

Is the average emissions at port.

Future Work



- Improve reliability, and scope of insights
- Port populations
- Information on the ships
- Flags and ship sizes
- Optimal speed
- Value chain factors(cargo owners etc.)
- Study across a time frame to asses particular legislations/policies.