SIGNAL™

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The Signal Group

THE SIGNAL GROUP

The Signal Group encompasses commercial ship management activities with a focus on technology.

Within The Signal Group there are three main parts:

SIGNAL™ MARITIME

The commercial management arm with a focus on sustainable, responsive, high performance service within Spot Chartering and Pool Management

Signal Maritime Services, Signal Maritime Aframax Pool

SIGNAL™ OCEAN

The technology arm which develops solutions to enhance commercial shipping performance and analyze voyage data

SIGNAL™ VENTURES

The strategic investment arm of Signal Group which focuses on relevant, complementary services and technology

OilX, Signal Maritime Box, Entrepreneurs-in-Residence

IMO targets / solutions

June 21 IMO adopted short term measures aiming at:

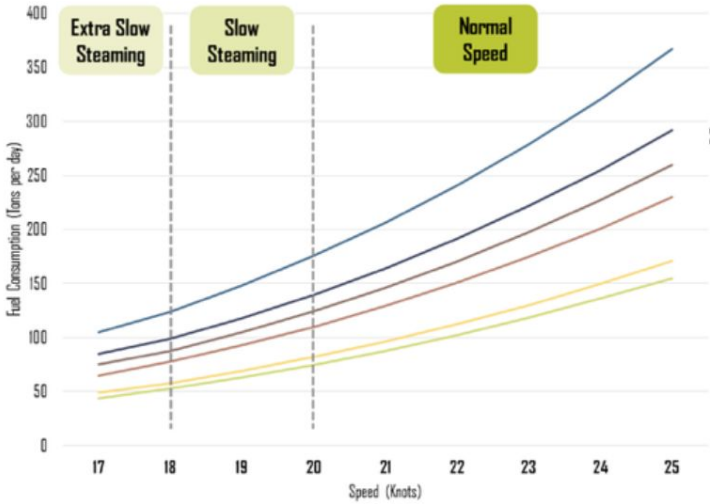
- 40% reduction on carbon emissions by 2030

- All ships will have to calculate their Energy Efficiency Existing Ship Index (EEXI) - CII (Carbon Intensity Indicators

How ?

But how commercial trading patterns today can reduce emissions?

Commercial trading patterns / Slow steaming



Commercial trading patterns / Slow steaming

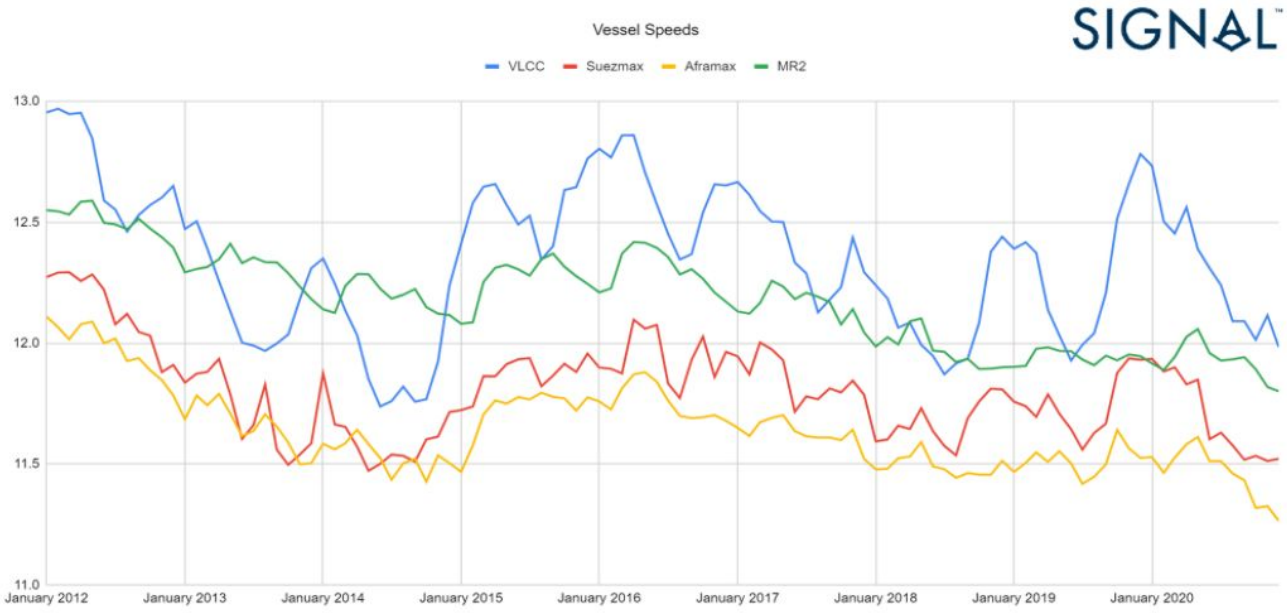
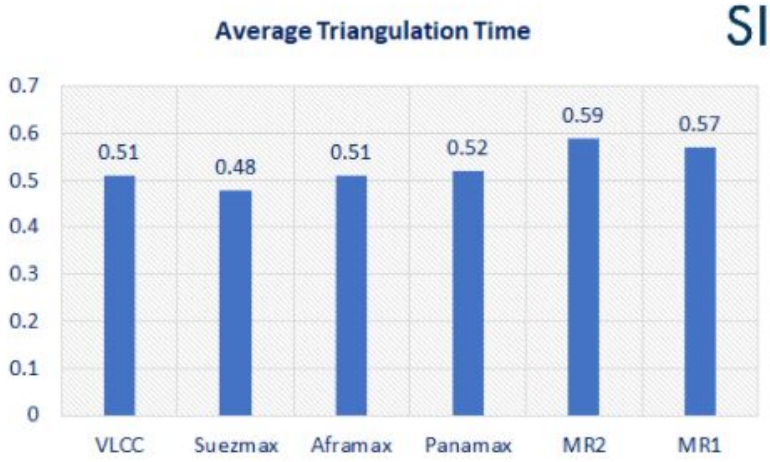


Chart 4: Speed report per vessel class. Signal Ocean Platform data.

We can say that with a 1 knot reduction in vessel speed in the laden leg, there is potential to save around 2 millions tons of CO2 on a yearly basis for tankers

Commercial trading patterns / Triangulation

Commercial trading patterns / Triangulation



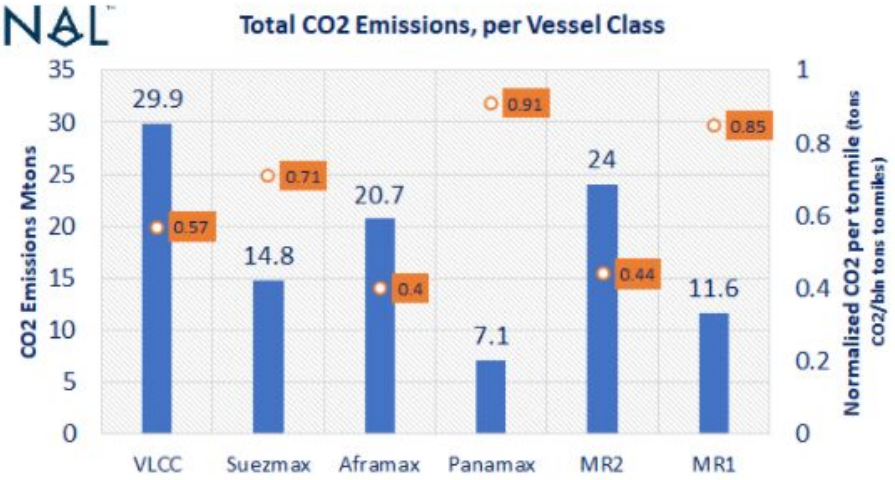


Chart 2&3:Average Triangulation Time and CO2 emissions per vessel class. Signal Ocean Platform data.

Which are the first steps towards achieving reductions today?

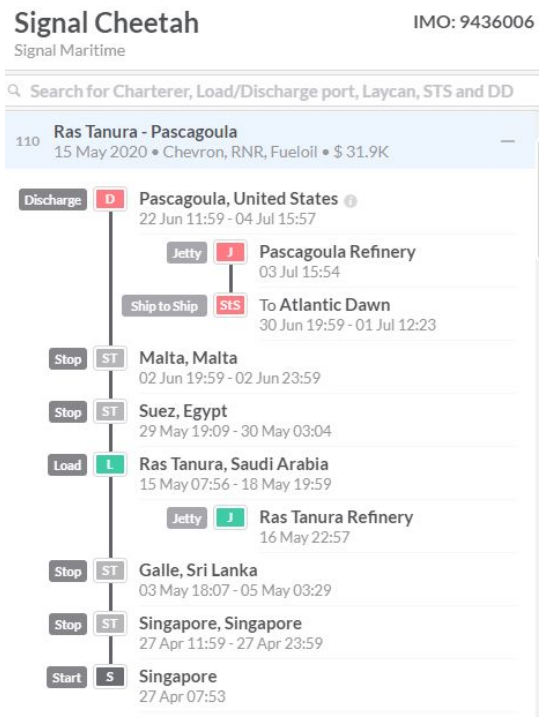
1  Understand/ Access emissions

2  Benchmarking with peers

3  Consider CO2 emissions in chartering decision making

How we estimate emissions

The Voyages Structure



Data Output


```
 "ID": "9436006.110",
"IMO": 9436006,
"VoyageNumber": 110,
"VesselName": "Signal Cheetah",
"VesselTypeID": 1,
"VesselType": "Tanker",
"VesselClassID": 86,
"VesselClass": "Aframax",
"TradeID": 1,
"Trade": "Crude",
"VesselStatusID": 1,
"VesselStatus": "Voyage",
"CommercialOperatorID": 1926,
"CommercialOperator": "Signal Maritime",
"StartDate": "2020-04-27T07:53:37Z",
"EndDate": "2020-07-04T15:57:12Z",
"ChartererID": 281,
"Charterer": "Chevron",
"CargoTypeID": 16,
"CargoType": "Fueloil",
"CargoGroupID": 130000,
"CargoGroup": "Dirty",
"CargoTypeSource": "MarketInfo",
"Quantity": 80000.0,
"LaycanFrom": "2020-05-15T00:01:00Z",
"LaycanTo": "2020-05-17T23:59:59Z",
"FixtureStatusID": 1,
"FixtureStatus": "FullyFixed",
"FixtureDate": "2020-05-04T06:46:38.32Z",
"FixtureIsCOA": false,
"FixtureIsHold": false,
```

How we estimate emissions

- AIS data have been converted into voyages. A voyage is the story of a vessel from the last discharge port to the next load to the next discharge
- All stops for bunkering operations, idle times, maintenance have been taken into account. Therefore ballast and laden legs as well as stops and port consumptions are clearly defined
- Consumptions are estimated for all vessels >25kt for Tankers & Dry Bulk based on a model that estimates consumptions, country built, year built, loading condition and speeds
- Distances are generated through proprietary models and split per SECA/ Non SECA areas
- Fuel consumption is mapped to different types (VLSFO, MGO, HSFO) based on the area the vessels have been trading as well as the information about if a vessel is scrubber fitted or not
- Emissions are derived from consumptions using IMO references

Demo

The CO2 data schema

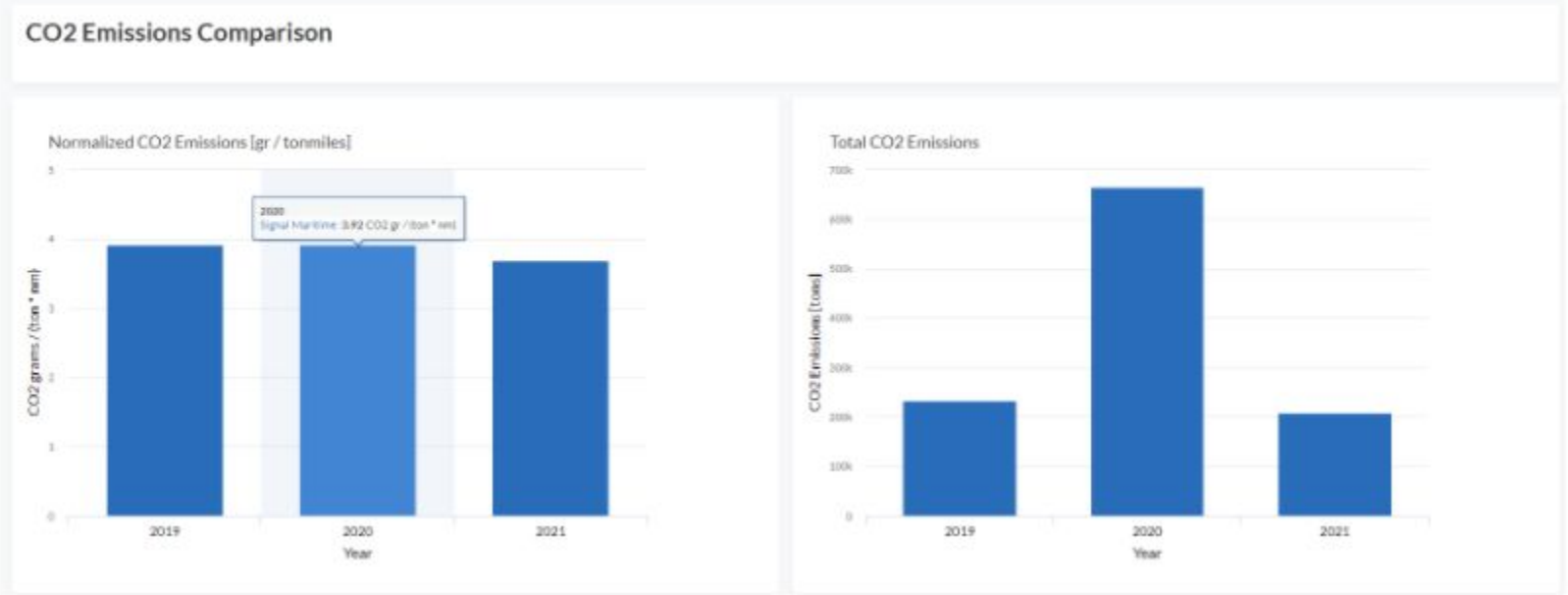
VESSEL CLASS | COMMERCIAL OPERATOR | TIME WINDOW

Aframax | 82 - 125 kt | + Signal Maritime | 6 months

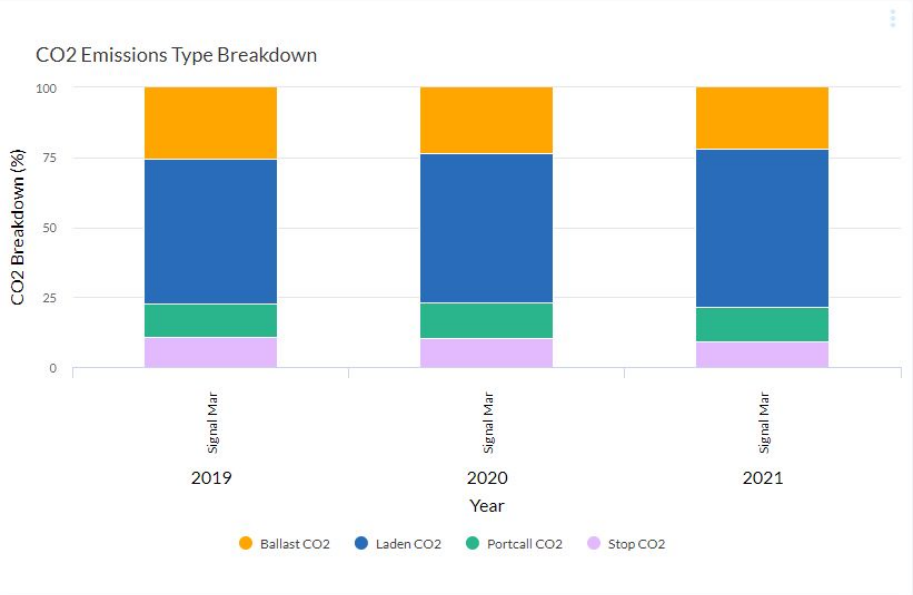
CO2 Emissions Per Voyage

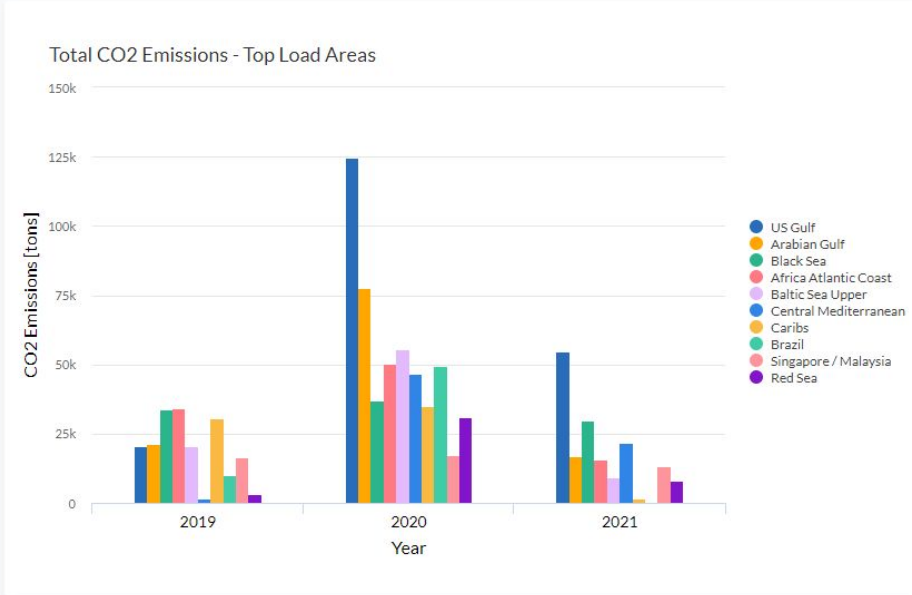
Ves...	Open ...	Load Po...	Disch...	CO2 gr/ TonM...	Total CO2 [kt]	Ballast CO2 [kt]	Laden CO2 [kt]	Portcall CO2 [kt]	Stop CO2 [kt]
(2) Sigr									
Signal Alpha	Bizerte	Augusta	Houston	3.84	2.8	0.1	2.2	0.4	0.1
Signal Alpha	Houston	Corpus Christi	Pembroke D...	3.62	2.2	0.1	1.8	0.3	0.0
Signal Alpha	Pembroke D...	Murmansk	Milazzo	3.62	2.9	0.4	1.8	0.5	0.2
Signal Alpha	Milazzo	CPC (Novoro...	Omisalj	3.89	1.3	0.3	0.5	0.3	0.2
Signal Maya	Fawley	Taman	Houston	3.57	4.6	0.9	2.6	0.7	0.5
Signal Maya	Houston	Houston	Rotterdam	3.78	2.7	0.0	2.0	0.3	0.4

STEP 1: Understand / Access emissions



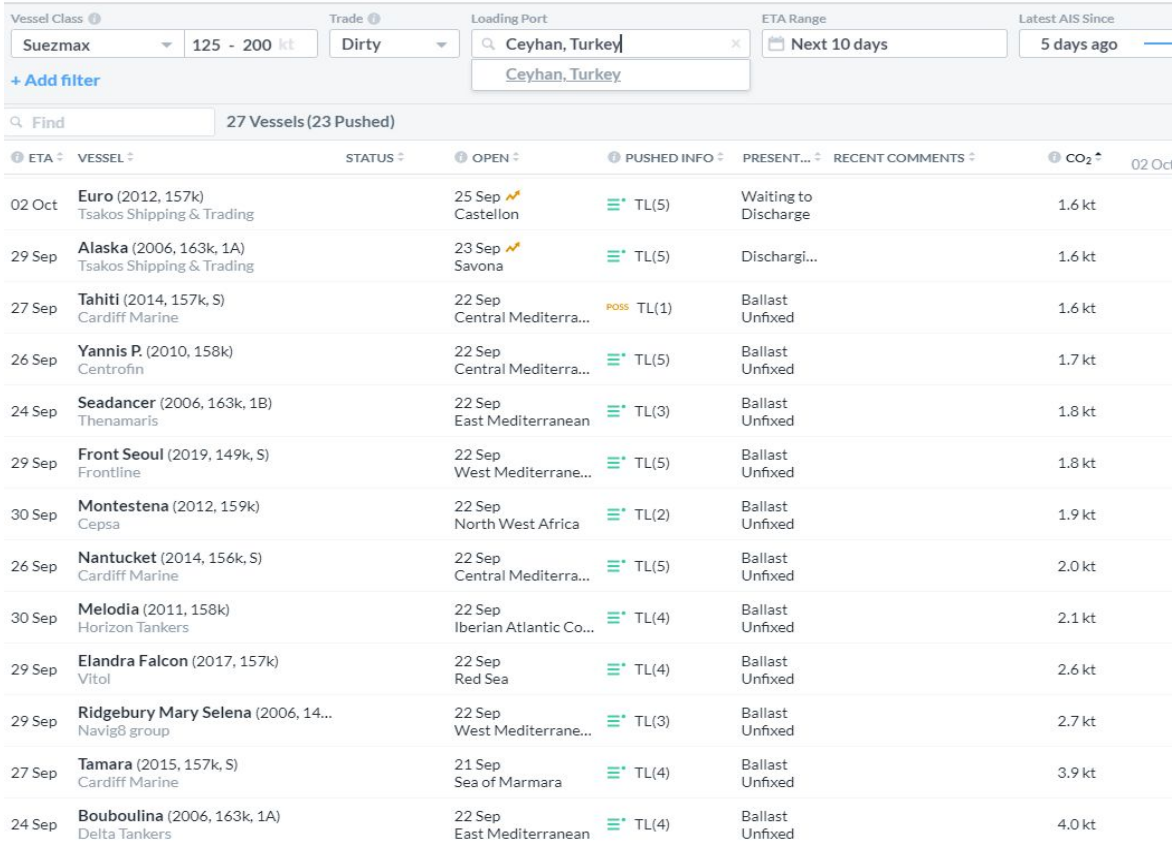
STEP 1: Understand / Access emissions





Benchmarking with peers

Consider CO2 emissions in chartering decision making



ETA	VESSEL	STATUS	OPEN	PUSHED INFO	PRESENT...	RECENT COMMENTS	CO_2
02 Oct	**Euro** (2012, 157k) Tsakos Shipping & Trading		25 Sep Castellon	TL(5)	Waiting to Discharge		1.6 kt
29 Sep	**Alaska** (2006, 163k, 1A) Tsakos Shipping & Trading		23 Sep Savona	TL(5)	Dischargi...		1.6 kt
27 Sep	**Tahiti** (2014, 157k, S) Cardiff Marine		22 Sep Central Mediterra...	POSS TL(1)	Ballast Unfixed		1.6 kt
26 Sep	**Yannis P.** (2010, 158k) Centrofin		22 Sep Central Mediterra...	TL(5)	Ballast Unfixed		1.7 kt
24 Sep	**Seadancer** (2006, 163k, 1B) Thenamaris		22 Sep East Mediterranean	TL(3)	Ballast Unfixed		1.8 kt
29 Sep	**Front Seoul** (2019, 149k, S) Frontline		22 Sep West Mediterrane...	TL(5)	Ballast Unfixed		1.8 kt
30 Sep	**Montestena** (2012, 159k) Cepsa		22 Sep North West Africa	TL(2)	Ballast Unfixed		1.9 kt
26 Sep	**Nantucket** (2014, 156k, S) Cardiff Marine		22 Sep Central Mediterra...	TL(5)	Ballast Unfixed		2.0 kt
30 Sep	**Melodia** (2011, 158k) Horizon Tankers		22 Sep Iberian Atlantic Co...	TL(4)	Ballast Unfixed		2.1 kt
29 Sep	**Elandra Falcon** (2017, 157k) Vitol		22 Sep Red Sea	TL(4)	Ballast Unfixed		2.6 kt
29 Sep	**Ridgebury Mary Selena** (2006, 14... Navig8 group		22 Sep West Mediterrane...	TL(3)	Ballast Unfixed		2.7 kt
27 Sep	**Tamara** (2015, 157k, S) Cardiff Marine		21 Sep Sea of Marmara	TL(4)	Ballast Unfixed		3.9 kt
24 Sep	**Bouboulina** (2006, 163k, 1A) Delta Tankers		22 Sep East Mediterranean	TL(4)	Ballast Unfixed		4.0 kt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Thank you