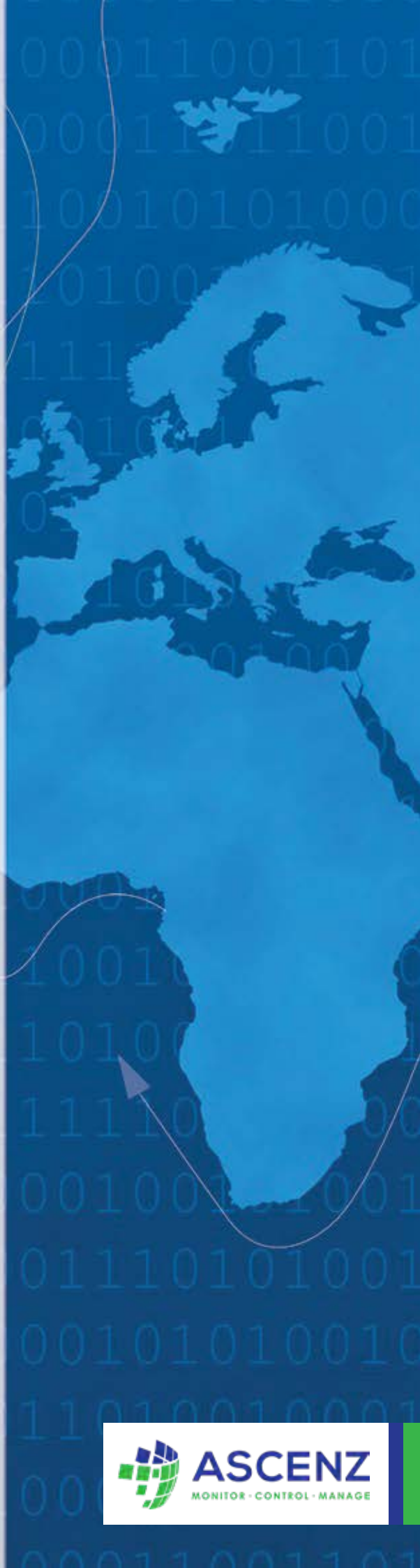
Shipulse
SMARTER AND GREENER

MARITIME IOT FOR YOUR FLEET

Asia's leader for vessel performance solutions for the maritime industry



ASCENZ
MONITOR · CONTROL · MANAGE

Shipulse
SMARTER AND GREENER

Our award-winning Shipulse solution suite delivers comprehensive and insightful information from monitoring fuel consumption, bunkering activities, other shipboard equipment, and weather, allowing better decision making for increased fuel savings and optimized vessel performance.

WHY SHIPULSE?

Performance

Track and present key metrics relating to fuel consumption, engine, and hull & propeller performance.

Bunker Control

Improve productivity and promote transparency in bunker procurements through remote monitoring.

CarbonComply

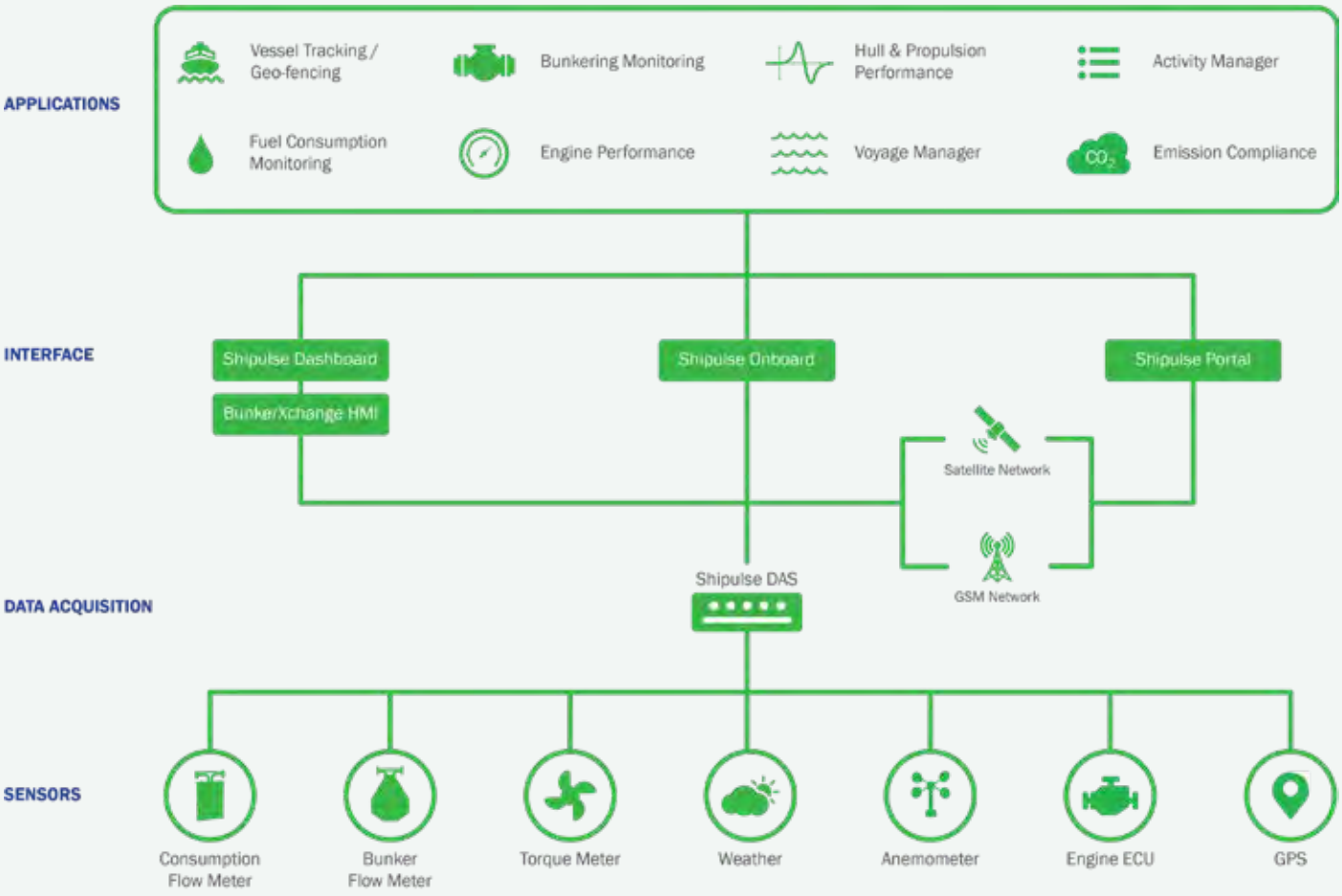
Compliance reporting system in line with IMO's emission targets and EU-MRV's regulatory standards.

> One **accurate** measurement is worth a thousand expert opinions

Admiral Grace Murray Hopper
Pioneer of Computer Programming and Data Processing

» Shipulse Suite

In our changing world, smart shipping is necessary for data driven decision making for fleet managers and crew alike. Ascenz' Shipulse is designed to put critical shipboard data and analytical tools at your fingertips to achieve performance optimization across your fleet.



ACCURACY FIRST

The foundation of data analytics is based on accurate and reliable data. Our proprietary Shipulse DAS promotes automation without human intervention and provides full transparency.

KNOW YOUR ASSETS

Track your entire fleet with various map overlay options including bathymetry, weather history and forecast, etc. to have an accurate depiction of your fleet activity around the world.

PUTTING YOUR DATA TO WORK

Our Shipulse Portal allows tracking of key metrics (e.g. SFOC, fuel consumption, etc), triggers alerts for performance benchmarks, and provide configurable charts for analysis.

ANYTIME, ANYWHERE

With internet connectivity, our Shipulse Portal gives you access to your fleet be it in your office or while you are on the road.

Shipulse Data Acquisition System (DAS)

We emphasize on an often ignored area in shipboard analytics - the importance of data acquisition. The Shipulse DAS is Ascenz' proprietary controller designed to integrate with shipboard sensors, collect, aggregate, and transmit data via both satellite and GSM networks. This transforms any vessel into a 'smart ship' capable of automatically capturing vital shipboard information and seamlessly transmitting them back to shore for further analysis.

Shipulse BunkerXchange HMI

Our BunkerXchange HMI is installed on the vessel to allow the crew and surveyor to monitor any bunkering activity. This allows real-time visualization of the bunker profile to improve productivity and procurement assessment. The bunker report and data can then be exported or transmitted back to shore securely.

Shipulse Dashboard

We empower your crew with the right tools for a responsive approach to how their ship operates. Real time data is displayed while vessels are in operation enabling the crew to monitor and manage operations effectively.

Shipulse Portal (Onboard / Cloud)

Through our Shipulse Portal, staff onshore are kept informed of their fleet activities, allowing better operational management and improved efficiency.

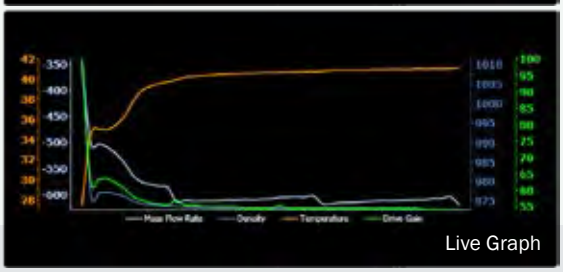
Live Monitoring

With our BunkerXchange HMI, crew onboard vessels wil be able to have a full view of ongoing bunkering activities. The estimated bunkering time may also be calculated when the required fuel amount is indicated.

Bunkering Visualization

- Provides real-time visualization of the bunkering process
- Toggle between the Bunker Diagram and Live Graph view
- Monitor key parameters such as drive gain, flow rate, density, and temperature


Bunker Diagram


Live Graph

Alarms & Reports

- Alarm panel draws attention to possible bunkering anomalies
- Exportable data and reports
- 'Touch and print' bunker profile analysis

Features & Benefits

Live monitoring

Data transparency

Alert to potential issues

Visualization of bunkering profile

Improved productivity and procurement assessment

Real Time Visualization

Our Shipulse Dashboard is a touchscreen embedded on the bridge that presents a real-time visualization of performance metrics. This promotes an immediate visual understanding of ship performance during actual operations and allows timely responses from the crew on benchmark deviations.

Fuel Consumption Dashboard

- Monitor fuel consumption
- Provides alerts when oil tank falls below or exceeds recommended levels

Engine Performance Dashboard

- Monitor SFOC* performance
- Compare historial SFOC performance vs. baseline

**Specific Fuel Oil Consumption*

Features & Benefits

- **Live monitoring**
- **Data transparency**
- **Alert to potential issues**
- **Visualization of data analysis**
- **Touchscreen panel**

Smarter Ships

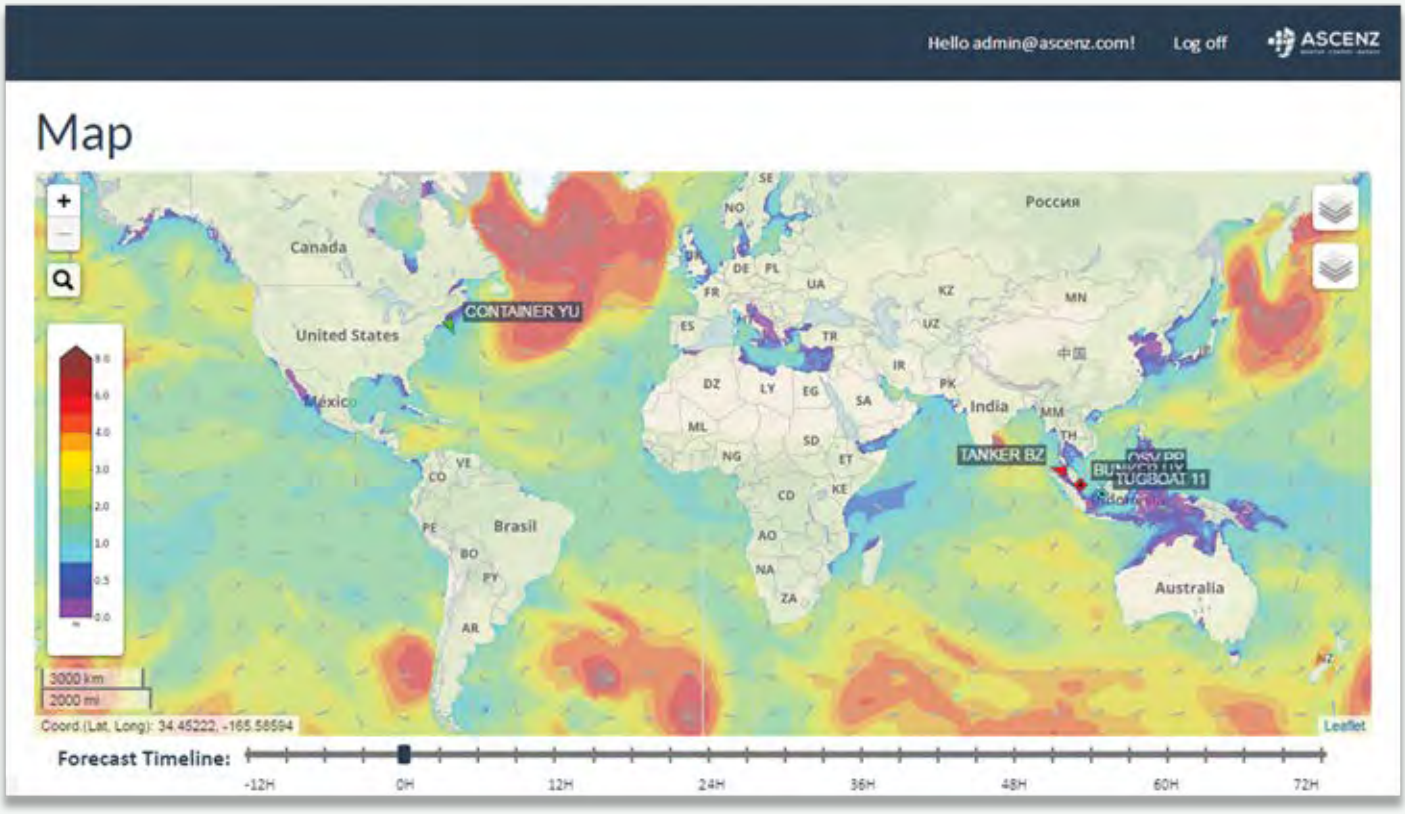
As the pioneer in fuel consumption monitoring, we set the standard for providing real-time accurate fuel consumption data from vessel to shore. Our Shipulse solution allows our customers to do effective vessel performance management by providing the right decision support tools.

» Fleet Tracking

Shipulse allows fleet managers to visualize their entire fleet on a world map, with tools to monitor vessel tracks and asset movements over time.

Our map tool further allows the overlay of important weather information such as:

- Significant wave height
- Peak wave period
- Wind
- Surface current
- Thuderstorm/Squall risk

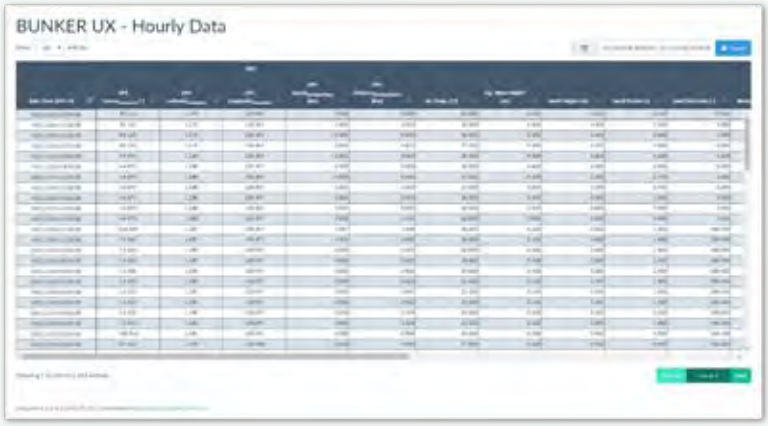


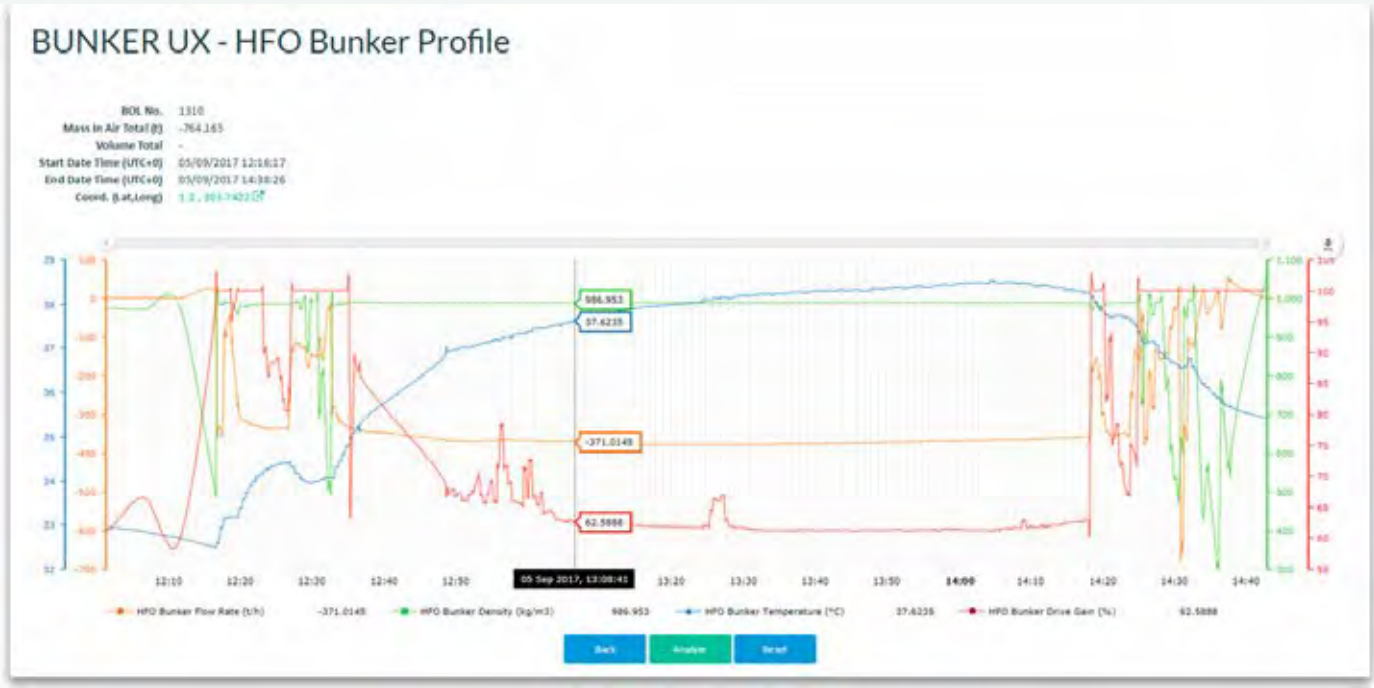
» Bunker Profiling

The system presents all bunkering transactions including bunker delivered and full bunker profile for procurement assessment.

The full view of bunkering activities is displayed in the Portal including data such as:

- Hourly data
- Daily data





Performance Analysis

Our system tracks and presents key metrics to fuel consumption, engine, hull and propeller performance. Charts and graphs can be generated for direct visualization of performance analysis.

- ME Daily Consumption

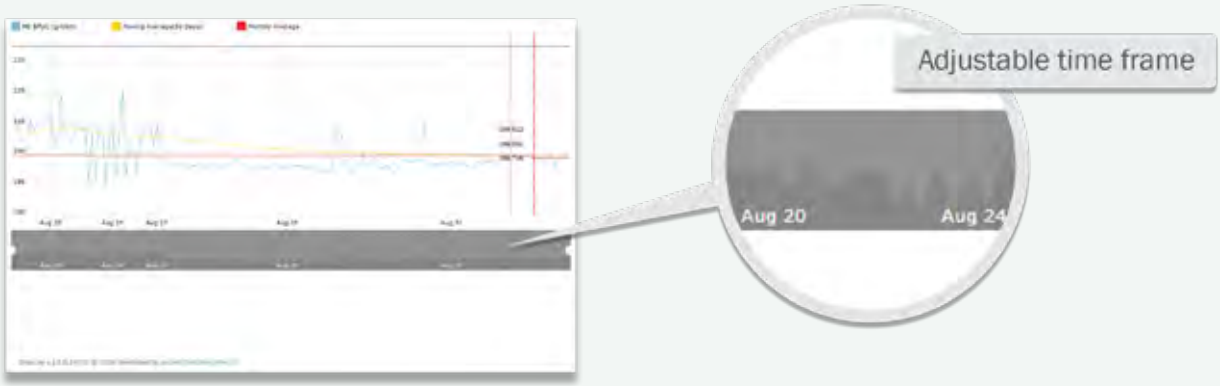
- Engine SFOC

- Hull & Propeller Performance

- Engine Load

Performance Index

Performance indexes are compiled into a single line graph to reflect overall performances of vessels, providing comparisons against benchmarks for better monitoring and continuous improvement.



Data Automation

Shipulse's Activity Manager seeks to automate the data mining process, significantly reducing the amount of man hours spent in manual collections of data. With the system in place, companies will be able to better allocate their resources to improve work efficiency.

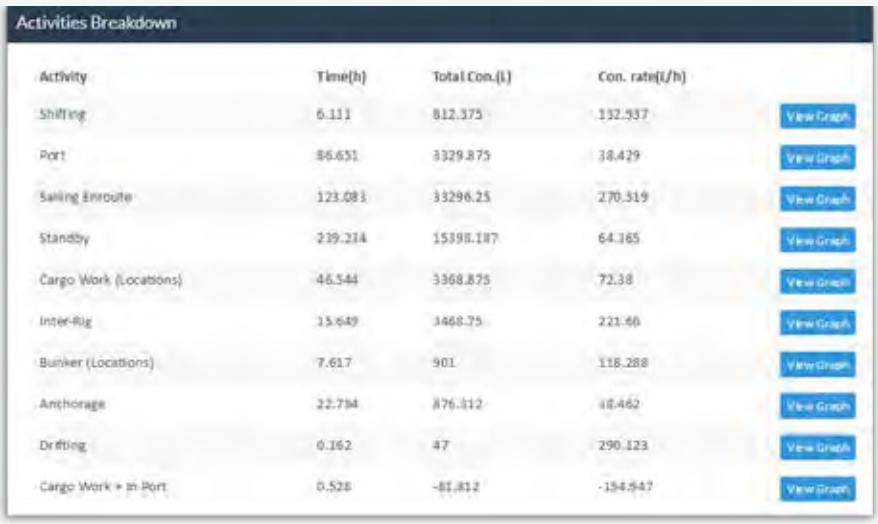
» Activity Dashboard

The Shipulse Activity Dashboard allows ship captains to directly monitor ongoing vessel performance and their efficiencies for better coordination, scheduling, and planning.

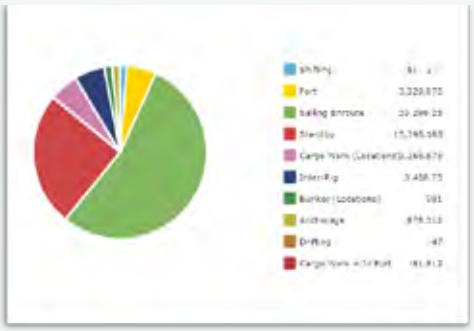
» Activity Management Portal

All information received via the Dashboard are registered onto the Shipulse Portal. The portal compiles a summary of activities each month, providing operators with a full overview of each vessel's performance and efficiency.

With the information gathered, the system automatically builds accurate and interpretable predictive models, transforming data into meaningful and insightful information.


Activities Breakdown

Activity	Time(h)	Total Con.(L)	Con. rate(L/h)	
Shifting	6.111	812.375	132.937	View Graph
Port	86.651	3329.875	38.429	View Graph
Sailing Enroute	123.083	33296.25	270.519	View Graph
Standby	239.214	15398.187	64.365	View Graph
Cargo Work (Locations)	46.544	3368.875	72.38	View Graph
Inter-Rig	15.649	3468.75	221.66	View Graph
Bunker (Locations)	7.617	901	118.288	View Graph
Anchorage	22.794	876.312	38.462	View Graph
Drifting	0.162	47	290.123	View Graph
Cargo Work > In Port	0.528	-81.812	-154.947	View Graph



» Voyage Management

Shipulse's voyage management solution addresses challenges faced by owners and operators by allowing greater visibility and control over their vessel operations. Moving towards an increasingly automated system, work processes are streamlined, enabling improved responsiveness, operational performances, and more efficient fleet utilization.

Detecting & Combining Voyages

The system automatically detects ports around the world based on the vessel's GPS location, providing Actual Time of Departures (ATD) and Actual Time of Arrivals (ATA). As such, ship owners are able to better monitor the start and end of each voyage.

ATD: Time when vessel leaves the port
ATA: Time when vessel reaches the second port

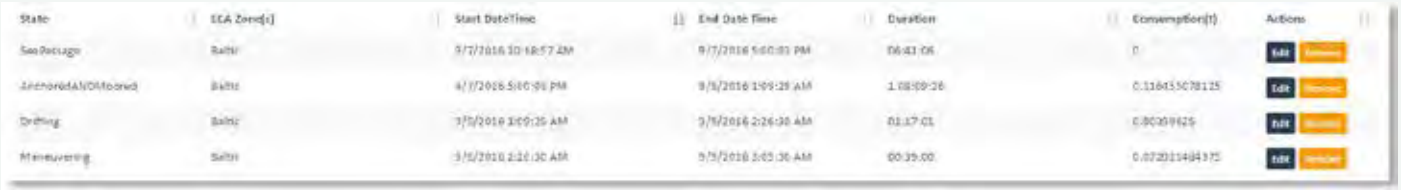
Voyage start: When vessel leaves the port
Voyage end: When vessel leaves the second port

Overall vessel voyages can be generated via combinations of detected voyages or through an indication of voyage period directly.

Voyage States

Voyages are broken down into different voyage states:

- Sea passage
- Manoeuvre
- Drift
- Moored/Anchored



All voyages within Emission Control Areas (ECA) Zones are reflected automatically. This allows ship captains and operators to make more informed decisions and to be able to evaluate the most cost effective voyage route while complying with IMO's regulations.

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EU-MRV REGULATION

WHAT YOU NEED TO KNOW

In a bid to quantify and reduce CO_2 emissions from shipping, the European Union (EU) introduced the EU-MRV regulations (Monitoring, Reporting, Verification) in Jul 2015. All ship owners and operators will have to monitor and report the verified amount of CO_2 emitted by their vessels to, from, and between EU ports.

Who does it impact?

Jul 15

Immediate effect:
Regulation passed by the EU Parliament on July 2015

GT

CO_2 emissions for all ships above 5,000 GT have to be monitored and reported, regardless of flag

All intra-EU voyages, all incoming voyages to EU port, and all outgoing voyages from EU port

Applies to ship movements for the purpose of transporting cargo or passengers

» CarbonComply

Shipulse encompasses features that equips companies with relevant data required for the submission of monitoring plans and emission reports.

Our CarbonComply module fulfills activity data monitoring required under EU-MRV *automatically*:

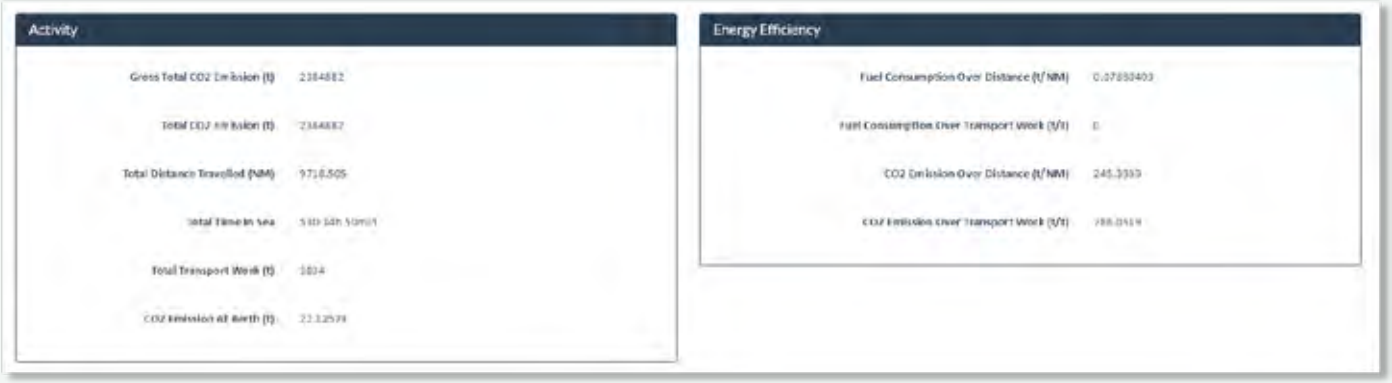
1. Port departure and arrival, including the date and hour of departure and arrival
2. Amount and emission factor for each type of fuel consumed in total
3. CO_2 emitted
4. Distance travelled
5. Time spent at sea

Bureau Veritas and PwC's Maritime Sustainability Centre has validated system compliance according to EU-MRV standards

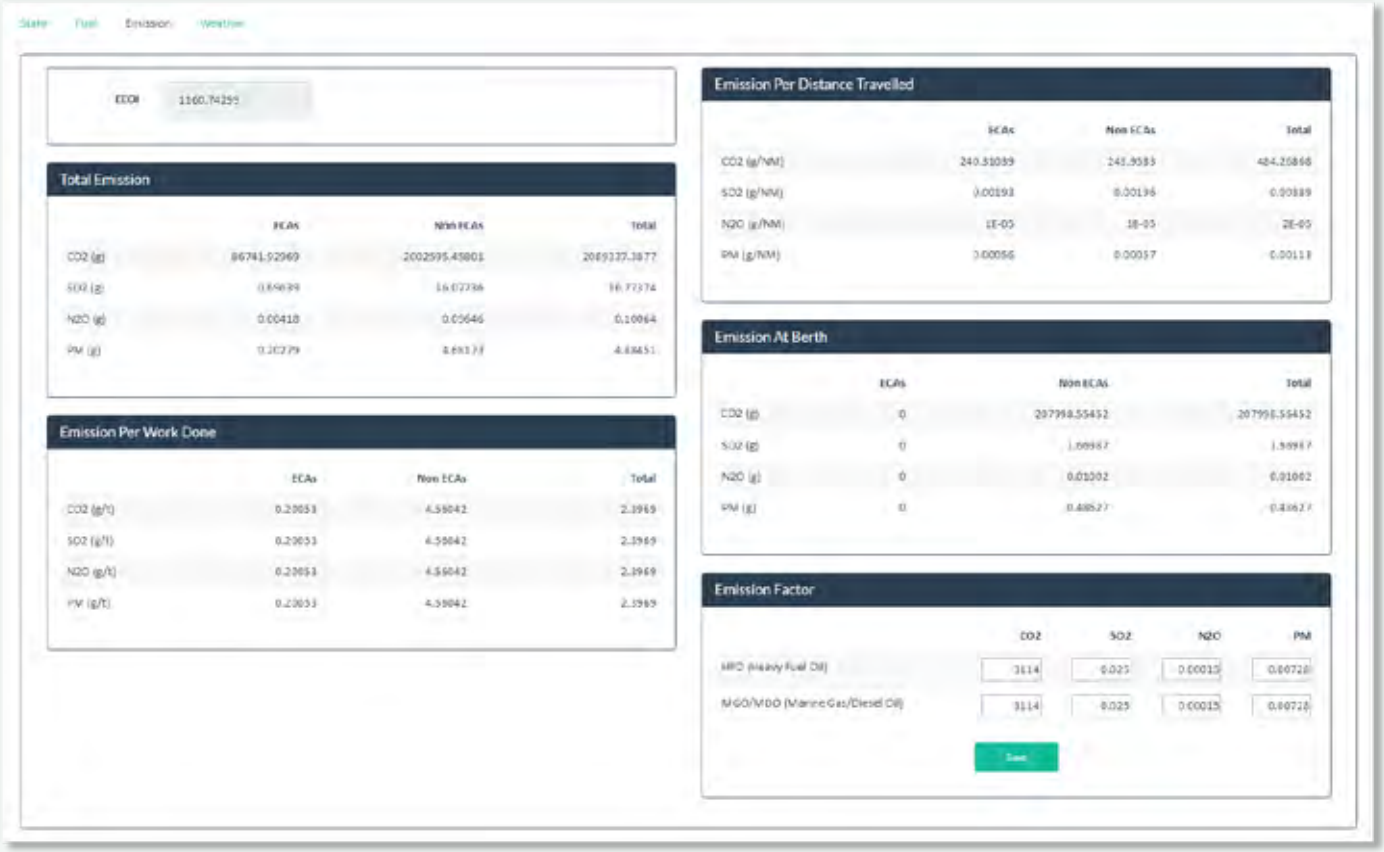
Monitoring Reports

From the data collected, a series of reports can be generated for analysis purposes:

- MRV Emission Reports
  Generates activity data required for Monitoring Plans.



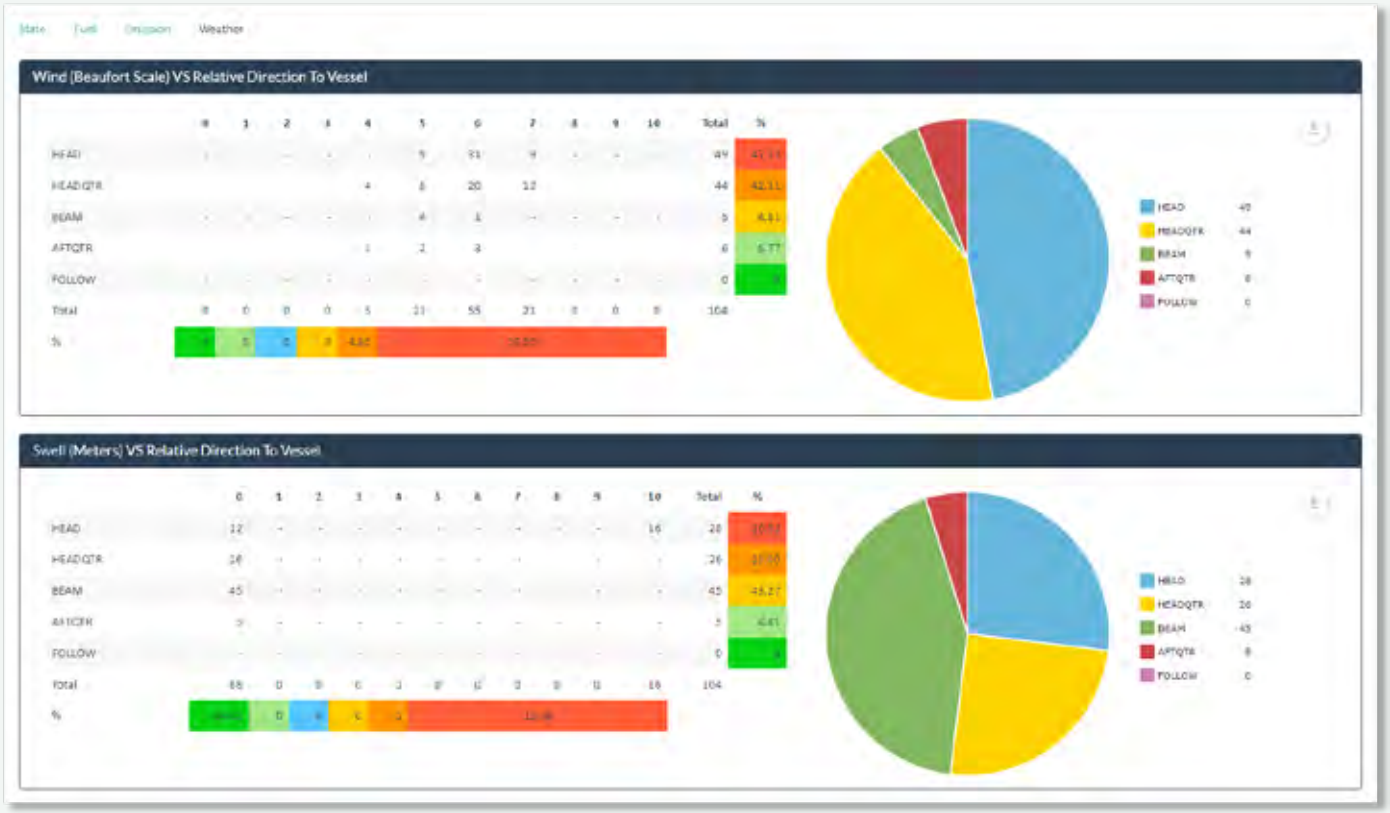
- Other Emission Reports
  Total emissions are separated into ECA and non ECA zones. EEOI will be reflected if voyage is within ECA zones.



Other Reports

- Fuel Performance Reports
  Performance insights on fuel consumption and fuel type.

- Weather Reports
  A breakdown of weather conditions for vessel performance analysis.



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Using Ascenz, fleet operators can:

Monitor

Provide visibility to users by collecting information from equipment for routine and ongoing monitoring.

Control

Compare measured performance against established standards and taking corrective action.

Manage

Use collected data and analyzed information systematically for informed decision making.

ASCENZ
MONITOR · CONTROL · MANAGE

Operating since
2008

40 team members

>1,200 mass flow meters installed

>400
vessels managed

700 MILLION
kilograms of fuel monitored per year

Headquarted in SINGAPORE

Direct presence
China, Germany, Indonesia, Japan, Korea, Myanmar, Malaysia, Taiwan, and the Netherlands

Agency representation
Bahrain, Greece, India, Italy, Nigeria, Thailand, U.A.E, and Vietnam

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