OPTIMIZING VESSELS' FUEL EFFICIENCY: A DATA-DRIVEN CASE STUDY

June 2024 | Case Study

Offshore Supply Vessels (OSVs) face unique challenges when optimizing fuel efficiency and operational practices. Streamlining operations to reduce costs and minimize environmental impact can be challenging with a diverse fleet serving various offshore activities.

However, implementing fuel efficiency measures can significantly reduce operational costs and environmental impact. Reduced fuel consumption directly correlates to a lower carbon footprint, aiding compliance with environmental regulations and supporting global sustainability efforts. As a provider of data-driven solutions, we have worked with many clients to enhance their fleet's fuel efficiency.

This case study delves into how our fuel efficiency program has resulted in significant fuel, cost, and environmental savings on our client's fleet.

Overview

In this case study, we examine the results of our fuel efficiency program across an average of +50 vessels, including W2W, USV, AHTS, FSIV, PSV, MPSV, and Survey Vessels. Learn how our Marine & Data experts analyze data from these vessels and provide our client with monthly reports, showcasing the substantial savings achieved.

Step 1: A Data-Driven Approach

Our digital solutions provide a data-driven approach tailored to our client's operational needs, encompassing:

- **Design-Based Consumption Models:**

Our experts developed AI-driven consumption models tailored to each vessel type, providing real-time insights into fuel consumption per activity.

- **Best Practices Implementation:**

We identified and implemented "Best Practices" for each vessel based on its design and operational context, optimizing engine configurations, speeds, and operational modes.

- **SisterShips Comparison System:**

Leveraging data from sister ships and vessels with similar characteristics, this system facilitated accurate benchmarking of vessel performance, enabling targeted optimization strategies.

- **Data Integration and Cross-Check:**

Integration of data from various sources to validate consumption models and declared consumption, ensuring robust cross-checking of data.

- **In-Depth Monitoring and Investigation:**

Our experts continuously monitored fleet performance, identifying deviations from best practices, and investigating root causes to provide tailored recommendations for improvement.

We provide daily, monthly, and yearly reports that monitor fuel consumption trends, including reported consumption (via StreamLog), estimated consumption (by our models), and sensor-tracked consumption (EFMS, AIS, weather)

Step 2: Our Fuel Efficiency Program

1. Vessel deviates from best practice
2. Opsealog flags deviation & estimates associated potential fuel savings
3. Opsealog contacts vessel to investigate deviation & provides best practice reminder
4. Notification is forwarded to company to cross-check vessel statement
5. Opsealog reviews best practices as needed taking into account vessel feedback.
6. Opsealog periodically provides update on potential fuel savings & fuel saved KPIs
7. Ongoing fleet monitoring to suggest continuous improvment & increased efficiency

Read more in our blog about fuel efficiency in field transits.

Step 3: Understanding the Fleet's Operational Profile

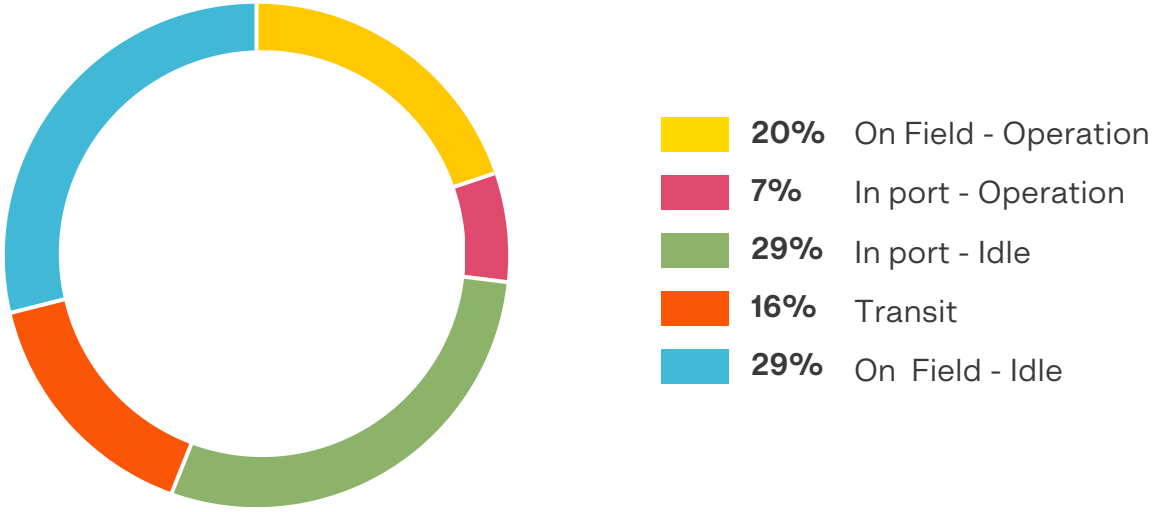
OSVs are vital to offshore operations but are significant consumers of fuel due to their varied and demanding operational profiles. To understand how improvements can be made, our team follows a structured assessment approach depending on the vessel's operational context:

- In Transit (To port, to field, interfiled): Define the best engine and speed combination for the most optimized fuel consumption.
- On Field (Standby): Encourage vessels to operate in the most economical mode based on context (e.g., availability of buoys and anchors). Conduct studies on installing mooring buoys in shallow or deep waters. For standby within or at the 500m zone, understand the reasons and ensure its feedback, then encourage vessels to return to normal standby, outside 500m, if possible.
- In Port (Standby): Help vessels perform standby in port alongside or at anchorage by promoting the use of harbor generators, auxiliaries, or shore power.

To illustrate, below is a graphic representing the operational profile of our client's fleet for one month. As shown, In-port Standby (Idle) and On-field (Idle) operations constitute 29% of each of the fleet's main activities.

FLEET OPERATIONAL PROFILE

December 2023



The Results

Fuel Saved and Potential Savings by Operation Type

In this report, the overall fuel saved in December is significant, especially for On-field operations, the fleet's major activity:

- **On Field (Standby): 276 m^3 fuel saved**
- In Transit: 20 m^3 fuel saved
- In Port (Standby): 14 m^3 fuel saved

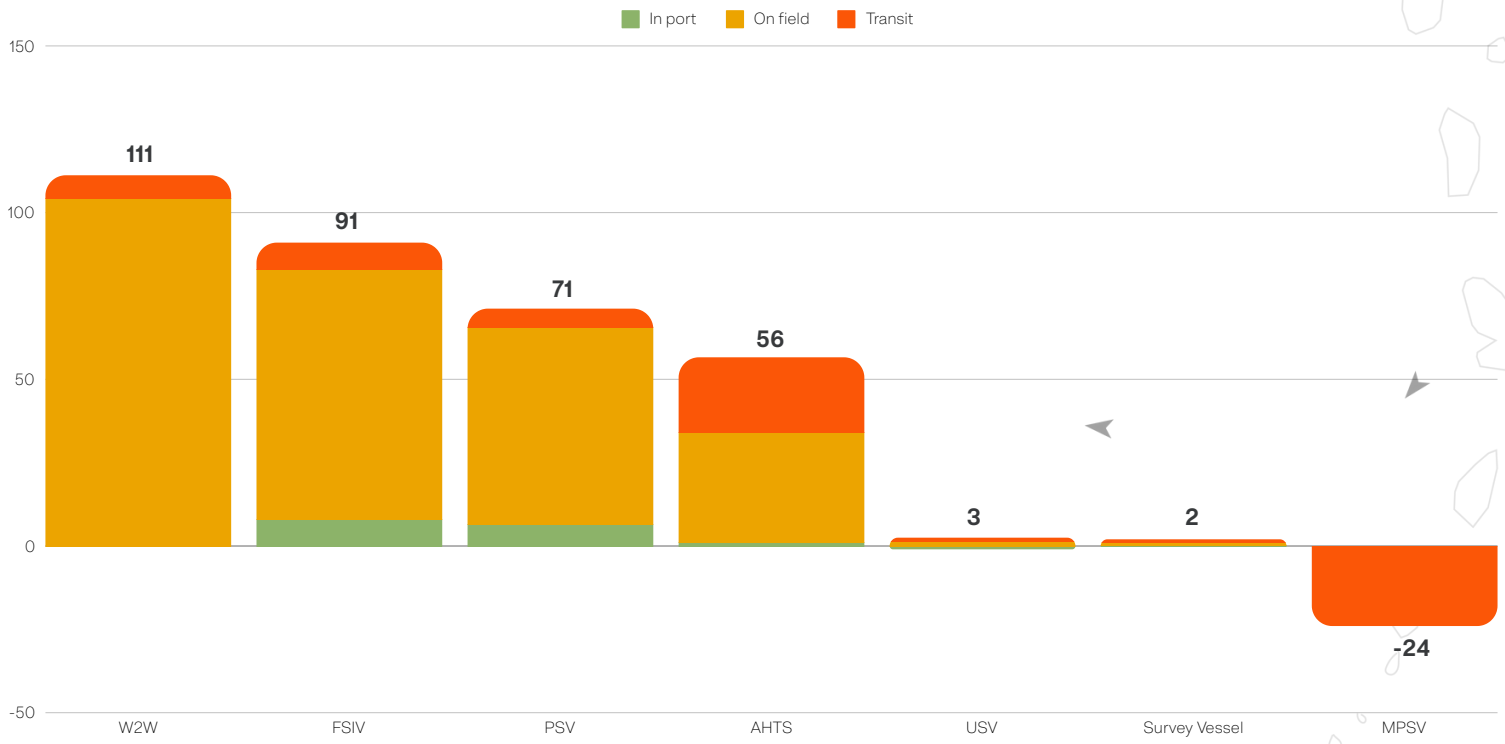
Savings are achieved through better operational practices, including engine usage, speed adjustments, and the use of mooring buoys during offshore standby and transit.

Fuel Saved per Vessel Type

The graph below clearly showcases how vessel types and operations affect fuel consumption. It highlights that on-field operations offer substantial cost and fuel savings.

FUEL SAVED PER VESSEL & STATUS

December 2023



Transparency is key; vessels that haven't or couldn't apply our best practices are included in our calculations. In this illustration MPSVs didn't achieve the desired results, underscoring the challenges vessels face in adopting fuel efficiency measures. Challenges can include:

- Anticipating Standby/Transit Durations by adopting the optimal engine configuration.
- Optimizing Engine Configuration by balancing economic speed without impacting schedules.
- Managing Environmental Hazards by ensuring fewer engines don't compromise maneuverability or safety

Understanding why a vessel didn't meet best practices allows us to adapt strategies to each vessel's characteristics and operational profile.

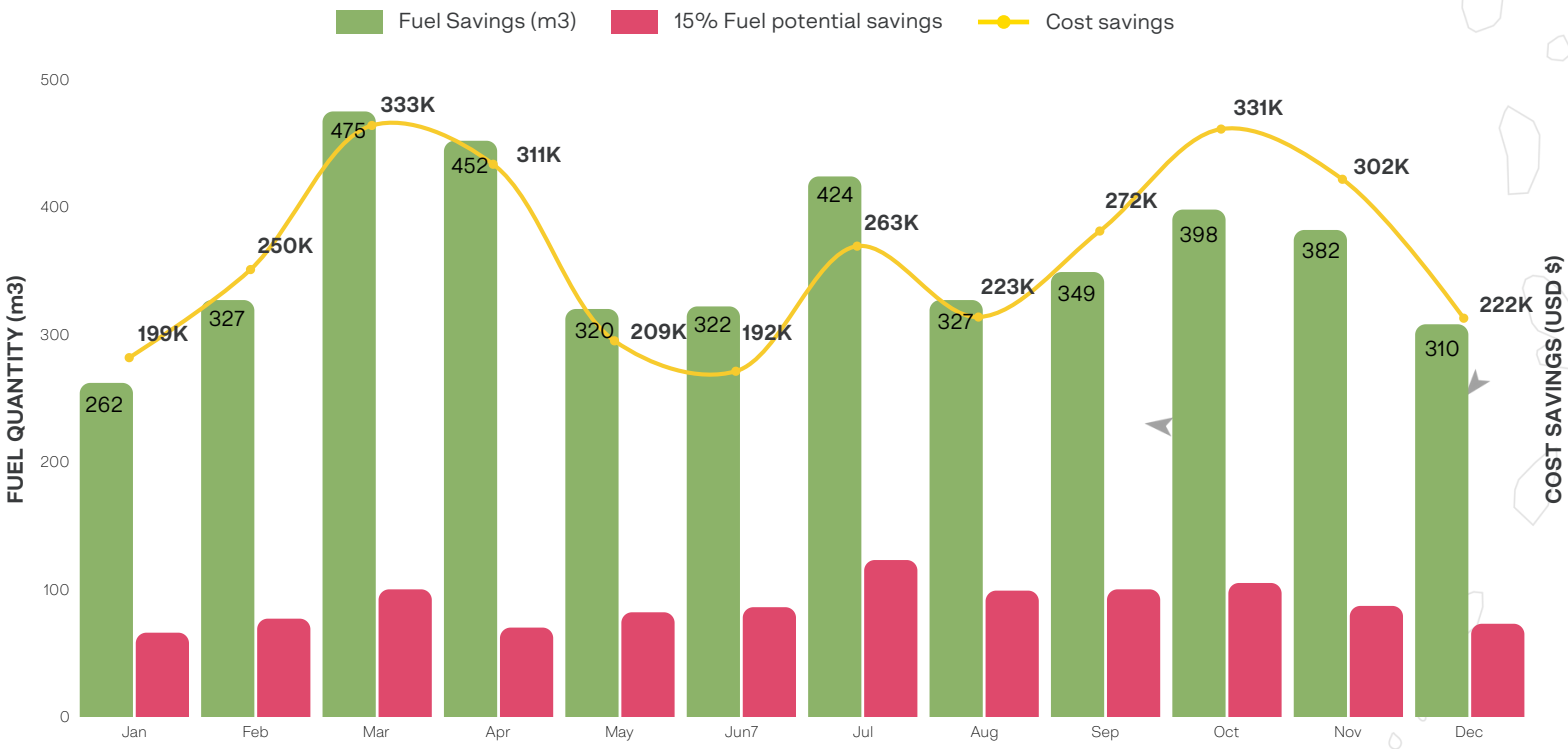
opsealog

Overall Results

Throughout the year our team provided monthly updates on fuel prices in the client's currency. This helps show clients the cost savings related to varying fuel prices. In the table below you can identify cost savings, fuel impact, and CO^2 savings our client achieve

FUEL SAVED & COST SAVINGS EVOLUTION

From January to December 2023



By optimizing engine configurations, speeds, and operational modes, vessels achieved substantial fuel savings, particularly during in-field operations. Opsealog's data-driven approach facilitates proactive monitoring and continuous improvement, ensuring best practices are consistently followed.

Over the past year, our client's partnership and their team's collaborative efforts have enabled us to achieve:

4 346 m3 Fuel Saved

+3M $ Cost savings

1 070 m3 Potential fuel savings

+ 11 T CO^2 Emissions saved

opsealog

Conclusion

Our client has improved their fleet operations by leveraging data-driven optimization strategies and achieved significant fuel, cost, and environmental savings. Our remarkable results are a testament to the trust and collaboration with our clients.

This success story highlights the importance of strong partnerships, as optimizing fuel efficiency requires coordinated efforts from both onshore and offshore teams. The dedicated work of the crew in applying our solutions and adhering to best practices has been instrumental in realizing these savings. This case study exemplifies what can be achieved when everyone works together towards a common goal.

If you haven't yet, check out our latest video about Fuel Efficiency: