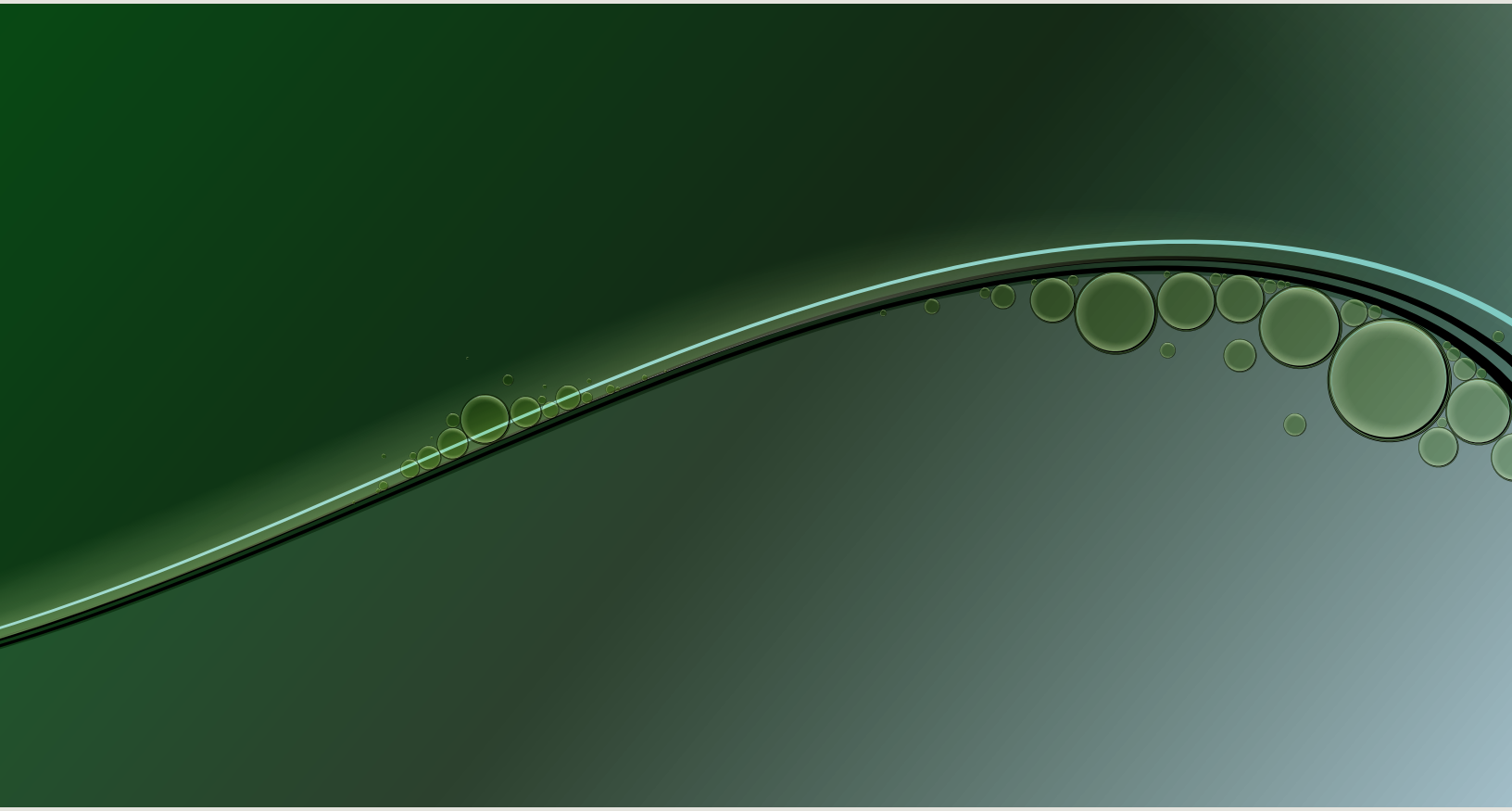
Renewable Diesel Benefits

for the Shipping Industry



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Introduction

As scrutiny over companies' environmental impacts intensifies, prioritizing sustainability within the supply chain has become essential. According to the EPA's 2024 report, the transportation sector accounts for 28% of total U.S. greenhouse gas (GHG) emissions, placing freight operations at the forefront of environmental accountability efforts.[1] Traditional diesel, while valued for its dependability and high energy density, is a significant source of GHG emissions, contributing to the industry's carbon footprint. With evolving customer expectations for sustainable practices, shippers are increasingly seeking ways to reduce their environmental impact without compromising operational efficiency or reliability.

Renewable diesel, derived from organic and renewable resources, presents an ideal solution to meet these sustainability challenges while maintaining current performance standards. Unlike biodiesel, renewable diesel is fully compatible with existing diesel engines, requiring no modifications and integrating smoothly into current freight operations. Offering the same energy performance as traditional diesel but with a significant reduction in GHG emissions, renewable diesel provides a strategic advantage to companies pursuing sustainability goals. While renewable diesel may carry a price premium over conventional diesel, it delivers long-term value by helping companies meet customer sustainability expectations, differentiate their brand, and align with emerging supply chain decarbonization efforts. Rather than viewing it as an added cost, shippers can position renewable diesel as an investment in long-term competitiveness and environmental responsibility. With its range of benefits—including reduced emissions, enhanced brand reputation, compliance with evolving regulations, and operational efficiency—renewable diesel enables the shipping industry to embrace a cleaner future while sustaining the performance critical to business success.

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Key Benefits of Renewable Diesel

Environmental Advantages

Renewable diesel enables a substantial reduction in GHG emissions compared to traditional diesel, making it a valuable option for shippers committed to sustainable operations. Lifecycle analyses indicate that renewable diesel can cut carbon dioxide (CO_2) emissions by up to 67%.[2,3] Additionally, renewable diesel generates fewer particulate and nitrogen oxide (NOx) emissions, promoting improved air quality and a healthier environment. By adopting renewable diesel, companies signal a meaningful commitment to environmental stewardship, aligning with broader corporate and customer-driven goals to reduce ecological impact. This commitment not only addresses regulatory requirements but also resonates with eco-conscious clients.

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Brand Upgrade and Corporate Reputation

In adopting renewable diesel, companies gain a strategic advantage in brand reputation and customer perception. As consumers and partners prioritize eco-friendly practices, renewable diesel provides a way for companies to differentiate themselves as industry leaders dedicated to reducing their carbon footprint. This proactive approach appeals to environmentally conscious clients, strengthens loyalty, and can even drive sales by aligning with buyers who value sustainable suppliers.

A recent study found that 85% of B2B buyers are more likely to choose suppliers committed to sustainability.[4] Additionally, between 2013 and 2018, products marketed as sustainable grew 2.5 times faster than conventional products.[5] These figures underscore the business case for sustainability; adopting renewable diesel not only reduces emissions but also enhances market competitiveness and appeals to environmentally conscious customers.

By integrating renewable diesel into their operations, companies can enhance their brand image and meet the growing demand for sustainable business practices. In a competitive landscape where buyers increasingly prioritize sustainability, adopting renewable diesel provides a tangible way for businesses to align with customer expectations, differentiate themselves from competitors, and future-proof their operations.

Talent and Human Resources

Additionally, companies committed to sustainability increasingly attract top talent, especially as younger generations actively seek employers with strong social and environmental values. In a 2024 Deloitte survey, 72% of Gen Z and 71% of millennial respondents said an organization's environmental policies influence their job decisions.[6] As workforce expectations evolve, companies that prioritize sustainability can strengthen their appeal to top talent, underscoring the importance of responsible corporate action. By incorporating renewable diesel, companies not only contribute to a cleaner future, but also reinforce their position as responsible corporate citizens, enhancing their employer brand and demonstrating leadership in sustainability.

Alternative Fuels and the Advantages of Renewable Diesel

Biodiesel

Biodiesel, similar to renewable diesel, is derived from renewable feedstocks like vegetable oils, animal fats, and recycled cooking oils. It provides a substantial reduction in lifecycle GHG emissions—approximately 50-86% lower than petroleum diesel.[2,3] However, biodiesel requires blending with petroleum diesel to achieve performance standards comparable to conventional diesel and may require engine modifications for compatibility. Additionally, biodiesel has a higher tendency to gel in colder temperatures, making it less reliable in regions with harsher winters. In contrast, renewable diesel is chemically akin to petroleum diesel, ensuring reliable performance across diverse climates and seamless compatibility with existing engines and fuel infrastructure.

Natural Gas (CNG and LNG)

Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) are fossil-based alternatives that reduce CO_2 emissions by 13-17% compared to diesel[7] depending on engine type and application.[8] However, adopting natural gas as a fuel source requires specialized engines and significant infrastructure investments, which can be costly for shippers. While natural gas produces lower CO_2 emissions than diesel, it remains a fossil fuel and is also a major source of methane. With a global warming potential more than 80 times that of CO_2 over a 20-year period,[9] methane emissions diminish some of natural gas's climate benefits. In contrast, renewable diesel delivers a greater reduction in GHG emissions without infrastructure changes, providing a more accessible and sustainable option for companies aiming to lower their carbon footprint while maintaining operational efficiency.

Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) are fossil-based alternatives that offer a moderate reduction in CO_2 emissions, approximately 15-20% lower than diesel depending on engine type and application.

Battery Electric Vehicles (BEVs)

Battery Electric Vehicles (BEVs) are often promoted as a zero-emission alternative due to their lack of tailpipe emissions. However, the overall environmental impact of BEVs includes emissions associated with battery production, the carbon intensity of electricity used for charging, and challenges related to battery disposal at the end of their lifecycle.

Operational Constraints

BEVs face significant operational limitations for freight applications. Heavy-duty electric trucks typically have a range of 200–250 miles per charge,[10,11] which is insufficient for long-haul operations compared to diesel trucks that can travel up to 2,000 miles on a single tank of fuel.[12] Charging times, which range from 2–9 hours depending on the power of the charging station,[13] further hinder productivity and increase downtime. Moreover, the current charging infrastructure is underdeveloped for heavy-duty applications, with most networks designed for passenger vehicles. High-powered charging stations capable of supporting large fleets and long-haul operations are sparse, particularly in rural and remote areas critical to freight transportation.[14,15] This lack of infrastructure increases operational complexity and adds significant costs for companies transitioning to BEVs.

Power Outages and Backup Generation

BEVs rely on stable and reliable electrical infrastructure for charging. Power outages and grid disruptions pose significant challenges for fleets relying on BEVs, particularly during natural disasters or in remote areas with less reliable power grids. To ensure continuity of operations, companies would need to invest in backup generators powered by fossil fuels, which would be prohibitively large and costly. For example, charging just 50 Class 8 trucks in a small pickup-and-delivery operation requires more electricity than powering 950 homes, making the economics of large-scale backup generation unfeasible.[16]

Mining of Materials for Batteries

The production of BEV batteries depends on raw materials like lithium, nickel, and cobalt, which require resource-intensive mining processes. These activities have significant environmental costs, including habitat destruction, high water consumption, and greenhouse gas emissions. For example, extracting one ton of lithium may require approximately 500,000 gallons of water, exacerbating water stress in mining regions.[17] Additionally, producing a battery for a heavy-duty BEV emits about 118,000 pounds of CO_2—nearly twice the emissions generated by manufacturing a diesel truck.[18] These upstream impacts contribute to the overall lifecycle emissions of BEVs, challenging their classification as a "zero-emission" technology when considering the entire supply chain.

In contrast, renewable diesel avoids such resource-intensive processes by using renewable feedstocks like vegetable oils and animal fats. This significantly reduces upstream environmental impacts, offering a cleaner and more sustainable alternative for lowering greenhouse gas emissions.

Disposition of Spent Batteries

Battery disposal presents significant environmental challenges. Lithium-ion batteries have an average lifespan of 3 to 12 years in heavy-duty applications, depending on usage and maintenance.[19] Without efficient recycling infrastructure, a significant number of spent batteries may end up in landfills rather than being properly recycled.

Renewable diesel, by contrast, avoids these end-of-life challenges entirely, offering a cleaner and more practical solution for reducing GHG emissions without introducing additional disposal concerns.

Renewable Diesel as a Practical Solution

Given these challenges, renewable diesel emerges as a more immediate and sustainable solution. It reduces greenhouse gas emissions substantially, seamlessly integrates with existing diesel engines and fueling infrastructure, and avoids the prohibitive costs and logistical constraints associated with building and maintaining a BEV-specific charging network.

Expanding Renewable Diesel Availability: East Coast Supply and Book-and-Claim Solutions

Overcoming Regional Availability Challenges

Renewable diesel availability in the United States is limited. Supplies remain more concentrated in western states, with distribution on the East Coast still developing. Only select carriers in the region have access to renewable diesel, making it important for shippers to work with providers that offer renewable diesel-fueled options to reduce emissions where supply is available. However, access alone does not guarantee renewable diesel will be used for a shipment. Carriers operate mixed fleets, and in most cases, shippers must opt into renewable diesel programs to ensure their freight moves on lower-emission fuel.

For shipments where renewable diesel is not directly available, including less-than-truckload (LTL) freight, book-and-claim provides an alternative for shippers seeking to lower their emissions. This approach allows shippers to purchase renewable diesel credits tied to verified fuel consumption elsewhere in the network, ensuring they receive the environmental benefits of renewable fuel even when direct fueling is not an option. By opting into these programs, shippers can claim verifiable emissions reductions and ensure their sustainability efforts directly contribute to lower-carbon freight operations.

More than 10% of all truck freight in the United States moves as less-than-truckload (LTL) shipments, representing a substantial portion of the market.

The Less-than-Truckload opportunity. Sustainability credit for the single pallet shipment.

More than 10% of all truck freight in the United States moves as less-than-truckload (LTL) shipments, representing a substantial portion of the market.[20] This makes LTL freight a critical area of focus for sustainability efforts. Final mile and other LTL shippers increasingly seek visibility into the emissions generated by transporting individual pallets from pickup to delivery.

Shippers should seek providers with industrial engineering teams that have developed a sophisticated book-and-claim process guided by a rigorous industry framework. Carbon accounting for single LTL shipments is inherently complex, with significant potential for error. Robust accounting methods ensure accuracy and reliability, offering shippers confidence in their environmental reporting. These systems enable shippers to "book" renewable diesel credits, tying their shipments to verified emissions reductions as renewable diesel is used elsewhere in the network.

By providing transparent tracking and reporting, these systems allow shippers to accurately claim sustainability benefits that align with their environmental goals. A hybrid model that combines direct renewable diesel supply with the flexibility of book-and-claim ensures shippers in the network can access renewable diesel's environmental advantages. This approach supports measurable progress toward carbon reduction targets while demonstrating a strong commitment to sustainable freight practices.

Conclusion

Renewable diesel offers shippers an immediate and impactful path to reduce greenhouse gas emissions, achieve sustainability goals, and enhance brand reputation. Benefits such as improved access to eco-conscious clients, stronger customer loyalty, and expanded sales opportunities make renewable diesel a strategic choice for aligning business growth with environmental responsibility. While regional availability remains a challenge, select carriers provide shippers with direct access to renewable diesel and a robust book-and-claim model, ensuring they can seamlessly leverage its environmental advantages. By partnering with a carrier that offers these solutions, shippers can efficiently decarbonize their supply chains, achieve measurable progress toward sustainability targets, and demonstrate leadership in environmental stewardship. Choosing the right provider empowers organizations to drive meaningful change, reinforcing their commitment to a cleaner, more sustainable future while gaining a competitive edge in the market.

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About A. Duie Pyle

A. Duie Pyle is a premier provider of asset and non-asset-based supply chain solutions offering a full range of integrated transportation and distribution services including LTL, Contract Dedicated, Warehousing, and Brokerage Solutions. Headquartered in West Chester, Pennsylvania, Pyle has been family-owned and operated since 1924 and remains committed to its core values of integrity, service first and empathy. With a focus on delivering exceptional customer service and supporting the growth and success of its employees, A. Duie Pyle continues to lead the way in the logistics industry.