



OPTIMUS
TECHNOLOGIES

**REDUCE FUEL COSTS
REDUCE EMISSIONS
EASILY**



BIODIESEL CONVERSION SYSTEMS

**FOR MEDIUM- AND
HEAVY-DUTY TRUCKS**

OPTIMUS TECHNOLOGIES

PROVIDES THE BEST RESULTS ...



GUARANTEED FUEL SAVINGS OF 10% OR MORE

Optimus Technologies® manufactures EPA-approved, biodiesel conversion systems for medium- and heavy-duty diesel trucks. With this simple approach, Optimus' solutions provide fleets the easiest way to reduce fuel costs, lower greenhouse gas emissions, and address renewable fuel targets—all with a low payback period.

Unlike any other conversion system, Optimus' solution can use a variety of fuels, from diesel to pure biodiesel (B100). Optimus' fuel partner network makes it easy for fleets to seamlessly procure fuel.

REDUCES GREENHOUSE GAS EMISSIONS OVER 80%*

Fleet operators have been besieged by rising fuel costs and incremental emissions regulations. The challenge is finding an alternative fuel solution that meets these opposing goals—easily and quickly. With Optimus Technologies, fleet operators can meet these challenges with a non-fossil fuel solution that has signifi-

cantly better emissions results than low biodiesel blends (B5, B20), compressed natural gas (CNG), liquefied natural gas (LNG), and propane (LPG). “CNG buses emit significantly more GHGs than do their petroleum-fueled counterparts, with emissions that are 34% higher for conventional NG and 20% higher for shale NG”.¹

MEETS RENEWABLE FUEL INITIATIVES

Pure biodiesel (B100) is developed from a wide range of sustainable, domestic feedstocks. Biodiesel meets strict specifications of ASTM D6751 and voluntary accreditation through BQ-9000® ensures production, handling, storage and testing in accordance with rigorous quality control that exceeds industry standards. No fossil fuel components are in these renewable fuels as with compressed natural gas (CNG), liquefied natural gas (LNG), or propane (LPG). While these fossil fuels are also considered “alternative fuels,” their production and use can actually increase net greenhouse gas emissions relative to diesel! With Optimus, there is a better alternative.

... SO FLEETS CAN DO MORE.

¹ Life-Cycle Analysis of Shale Gas and Natural Gas, Argonne National Laboratory, December 2011



VEHICLE CONVERSION COST ~20% OF CNG*

Fleet operators want easy, low-risk solutions to lower existing fleet fuel costs while meeting emissions, sustainability, and domestic fuel targets. Biodiesel blends, while headed in the right direction, only reduce emissions a small amount. Other alternative fuel solutions are available, but they include more than just a converted fuel system and the fuel—they require a complete change of fuel system technology (e.g. from liquid to gaseous), changes to driver and mechanic behavior, different troubleshooting and maintenance procedures, and new dedicated infrastructure. The costs and operational changes required for those *total* solutions are prohibitive.

FUEL STATION CONVERSION COST ~10% OF CNG*

Alternative fuels such as CNG seem attractive because of their current low fuel prices. However, CNG has a few costs that are not so obvious. CNG fueling stations can cost \$1-6M (based on storage capacity and speed of fueling). Further, CNG use requires special operator training and facility certifications due to the compressed and highly explosive nature of the fuel and tanks. CNG can also have extended fueling times (overnight). And, to add to these costs, the

environmental and health impacts from natural gas drilling (via fracking) are yet to be fully understood. However, studies show an overwhelmingly negative impact.²

With Optimus Technologies' biodiesel conversion systems, total costs are far less than for CNG or LPG/LNG. In addition, Optimus' solutions are much easier—with the same size fuel tanks as diesel and fueling stations that require little to no modification. When you look at the total solution, Optimus' system costs less—providing a much faster payback and better return on investment—when compared to other alternative fuel options.

POWERING A WIDE RANGE OF FLEETS

Overall, Optimus Technologies' solutions are ideal for reducing costs and improving emissions for regional and local fleets that are managed by commercial or government organizations. Optimus is ideal for fleets in the following applications:

- Retail/Wholesale Delivery and Transport
- Waste Services
- Construction (Cement, Dump)
- Road Maintenance
- Regional Commodity Hauling

*Contact Optimus for comparison data

2 <http://insideclimatenews.org/news/16102015/fracking-studies-overwhelmingly-indicate-threats-public-health-air-water-pollution>

OPTIMUS TECHNOLOGIES' SOLUTION

IS THE EASIEST
ALTERNATIVE

OPTIMUS' VECTOR SYSTEM IS:

- a bi-fuel solution that enables a truck to run exclusively on biodiesel. To optimize fuel savings and emission performance, the Vector System powers the engine on renewable fuel 100% of the time other than startup and shutdown. It allows fallback to diesel operation if necessary.
- a bolt-on conversion system which reduces operating costs without rebuilding, replacing, or significantly modifying existing engines.
- engineered to optimize the use of existing renewable fuels and to accept new fuels as they emerge.
- a combination of patent pending mechanical hardware and software.
- an intelligent system - enabling tracking and quantitative analysis of cost savings, emission reductions, and petroleum offsets.
- a fully automated and user-friendly system that doesn't require the driver to change their processes or driving habits.
- a flexible solution that can run on pure diesel if desired, eliminating refueling anxiety associated with other alternatives such as CNG.



UNIQUE ATTRIBUTES INCLUDE

REGULATORY APPROVAL

Optimus is the only company with EPA approval for biodiesel conversion systems designed for medium- and heavy-duty trucks.*

RUGGED

Built exclusively for medium- and heavy-duty trucks that operate in harsh environments across a broad temperature range.

SEAMLESS INTEGRATION

Integrates into existing engine systems and never inhibits the use of traditional diesel. The renewable fuels utilized can be dispensed from existing diesel fuel stations.

PURPOSE-BUILT SOFTWARE

Optimizes the use of cleaner fuels without the need for driver input and enables tracking of engine parameters for fleet technicians.

EASY INSTALLATION & MAINTENANCE

Can be installed quickly either by Optimus or customer mechanics. Maintenance requirements are similar to the OEM diesel system.

**Contact Optimus for details*

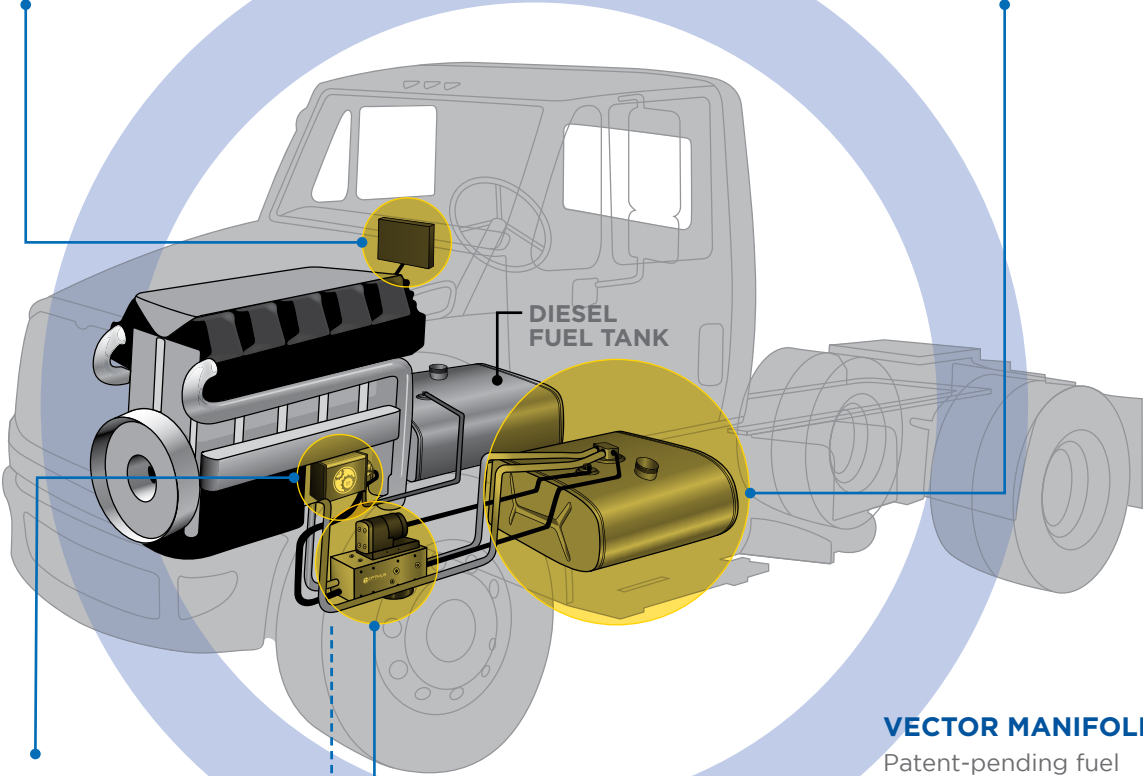
OPTIMUS TECHNOLOGIES' VECTOR SYSTEM

USER INTERFACE

The Vector System is completely automated and requires no input from the driver; however, the User Interface does provide the driver with system information such as operational status, fuel level, and alerts for any critical errors.

VECTOR FUEL TANK

Includes in-tank heat exchanger and fuel pick up / return lines. The Vector can utilize existing tanks or new tanks, easily retrofitted onto the vehicle based on fleet requirements.



ELECTRONIC CONTROL UNIT (ECU)



Is a purpose-built platform that communicates with the engine's control module, the Vector Manifold, and the Remote User Applications. The ECU optimizes the use of the new fuels and enables tracking and analysis of cost savings, emission reductions, and petroleum offsets. The ECU also has the capacity to record all system parameters—as well as operational and engine performance data—and transmit this to an Optimus server.



VECTOR MANIFOLD

Patent-pending fuel processing module that includes a heat exchanger, fuel pump, fuel/air separation system, sensors, and a specially designed fuel filter.



REMOTE USER APPLICATIONS

-  The management interface gives access to logged data, fuel usage metrics, GPS features, and real-time system performance.
-  The technician service portal assists with diagnostics and troubleshooting, enabling mechanics to program system parameters, extract data, and log maintenance procedures.

  Both applications are enabled through wireless connection to the ECU; all system information is stored on a remote server hosted by Optimus.

OPTIMUS TECHNOLOGIES

PROVIDES ALTERNATIVE
FUEL SOLUTIONS ...

FUEL IS SIMPLE

ENABLE FUELING SYSTEMS

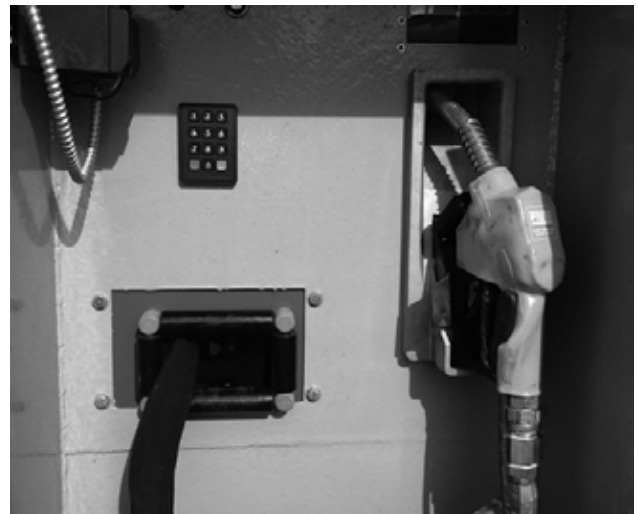
With the Vector system, customers require access to a fueling station that supports B100. Fuel support is easily accommodated by simple modifications to existing diesel refueling tanks or inexpensive, portable biodiesel stations. Such refueling systems can coexist with diesel and biodiesel blend pumps since the renewable fuels have a higher flash point than traditional diesel—meaning it is far less flammable and thus safer to store, transport, and handle.

ACCESS FUELS FROM A RANGE OF SUPPLIERS

For home-based fueling stations, biodiesel is obtained from a range providers. Feedstocks for biodiesel include distillers corn oil (a by-product of ethanol), recycled cooking oil, other plant oils (e.g. soy, algae, etc.), animal fats, and a host of other sustainable, domestic fuel sources. If your fleet does not have a refueling station, Optimus can provide stations from 1,000-20,000 gallons.

SAVE FUEL COSTS

Biodiesel is different than petroleum-based fuels in multiple ways. For one, biodiesel is considered “carbon neutral” relative to greenhouse gases. While burning biodeisel does create carbon emissions, they are offset by the plants used to make them. Further, pure biodiesel (B100) is less expensive, does not contain any petroleum fuel, and is domestically produced. Currently, there is over 2.5 billion gallons (and growing) of production capacity in the US, the biodiesel industry supports over 50,000 jobs, and it contributes billions of dollars to the US economy.



Biodiesel is eligible for state and federal incentives and tax breaks which further lower the total costs of deployment. Many states have low cost loan and grant funding programs available to assist with deployment of biodiesel. Overall, when you see how much you can save versus diesel, it is easy to move toward a biodiesel solution with Optimus.



OPERATIONS AND MAINTENANCE ARE SIMPLE

MINIMIZE CHANGES TO OPERATIONS

Maintenance of a fleet demands equipment and processes that are simple and easy to support. Unfortunately, this is not always the case with alternative fuel solutions—batteries with short lives, CNG systems that require special training and certifications, LNG systems that operate at cryogenic temperatures of -260°F, et cetera.

With Optimus Technologies' conversion system, operations and maintenance are much simpler and easier. Operators can refuel trucks in the same amount of time as with diesel, without any special training or certifications.

Operations run smoothly over a wide range of temperature extremes with heated fuel tanks for extreme cold environments. Regular maintenance activities for the Vector System focus solely on the simple replacement of a fuel filter within the Vector Manifold.

MINIMIZE MAINTENANCE CHANGES

Maintenance impacts on the diesel engine are negligible since B100 is significantly more lubricating than regular diesel fuel. Enhanced lubrication from biodiesel reduces wear on fuel system components such as pumps and injectors.

The Vector System's intelligent software and hardware, combined with certified renewable fuels, eliminates issues commonly associated with biodiesel, such as clogging, corrosion, and coking. Further, Optimus' solutions are compatible with all modern emission after-treatment systems



such as selective catalytic reduction systems (SCRs) and diesel particulate filters (DPF).

OPTIMUS MAKES IT SIMPLE

Maintenance costs are minimized through product and service warranties. Optimus Technologies provides worry-free repair and replacement on all of its parts and provides installation and maintenance training so that fleets may scale their operations on their own if they so desire. The Optimus Warranty

Program covers the engine for 12 months, 100,000 miles or through the expiration of the OEM warranty (whichever comes first), and extended coverage can be added for an additional fee. This includes 100% parts and labor protection up to \$20,000 per engine. Optimus' warranty is utilized in instances where an OEM denies existing coverage; making sure you're protected and back in operation quickly.

In the end, Optimus Technologies provides the best alternative fuel solution for medium- and heavy-duty trucks by significantly reducing fuel costs and emissions more easily than other solutions.





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AND EMISSIONS
SIGNIFICANTLY**
FOR THEIR EXISTING TRUCKS.