



Two Fuels Are Better Than One™

The OptiBlend® Dual Fuel Solution

Executive Summary

Vital facilities need backup power when disaster strikes. These facilities rely on outdated and obsolete technology for backup power. The antiquated technology that is being used are primarily single-fuel-source generators. Organizations rely completely on one fuel source to be able to get them through outages. If this single fuel source runs out, their facility runs the risk of losing lives, money, and reputation.

OptiBlend® has created a solution to end the unsecure nature of single-fuel-source backup power by allowing the engines to simultaneously run on two fuels: diesel & natural gas. By blending these two fuels, it extends the runtime of the backup unit, and makes the unit cheaper to run. Instead of worrying about when diesel will next be available, facilities can feel more secure knowing their generator can run longer.

The OptiBlend® system is robust and has been used in facilities such as hospitals, oil fields, data centers, and more. With a fundamentally safe design, it prioritizes engine health, while giving these vital facilities extended backup runtime. OptiBlend® can be fitted to almost any new or existing engine. OptiBlend® creates more secure, longer lasting, greener, and cost-effective backup power.

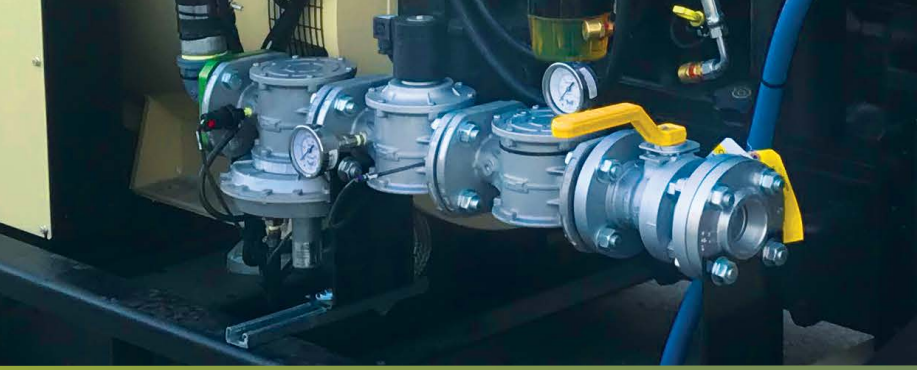
Issues facing organizations & what they have lost

■ During the COVID-19 pandemic, power was lost at a Colorado Kaiser Permanente facility resulting in the loss of 165 doses of the scarce vaccine (Lynn, 2021). At that time, due to the low availability of the life-saving vaccine, any number of doses being lost to a lack of backup power was unacceptable. The monetary loss was estimated to be \$5,800 dollars in vaccinations (Kaplan & Wehrwein, 2021). Additionally, the facility and company faced losing their reputation of being able to serve the public when their help was needed most.

■ In 2017, Atlanta Hartsfield-Jackson International Airport faced an unacceptable power outage that resulted in fires, safety concerns, and trapped customers (Andrews, 2017). A social media outcry attacked the reliability of the airport's backup power capability. Planes were grounded and passengers were stranded, all due to failed backup power.

■ It has been asked by journalists and news publications, "Why Do Hospital Generators Keep Failing?" (Ornstein, 2012). At the Johnson Memorial Medical Center, the power failed during the peak of Tropical Storm Irene (Fink, 2009). Without any backup power available, they had to begin rushing patients to other facilities, which jeopardized their lives. They only had one available fuel source and it ran out when they needed it most. Another similar situation happened during Hurricane Sandy in 2012 at The Palisades Medical Center (Hudson, 2012).

■ Hurricane Harvey spread mass destruction across Texas. It created incredible hardship not only for the citizens living through it, but for many businesses as well. When a petrochemical plant's backup power failed, it caused a massive explosion (Zhang, 2017). People had to evacuate, lives were in danger, and the facility will need to be rebuilt.



The Solution



OptiBlend® has created a more secure solution for when backup power needs to be activated.

The OptiBlend® solution provides traditional, single-speed diesel engines the ability to run on two fuels simultaneously, thus offsetting diesel fuel consumption and thereby extending the runtime of a backup unit. OptiBlend® uses the fumigation method and Venturi-style mixers to introduce natural gas into the intake airstream of a diesel engine. This process of blending diesel and natural gas in an engine is commonly referred to in the industry as dual fuel.

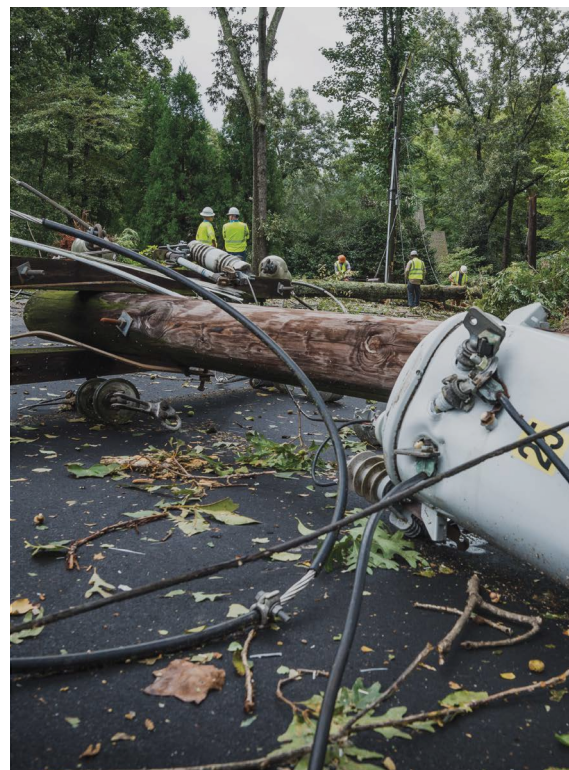
The OptiBlend® kit has the potential to double the runtime of an engine with its existing diesel tank.

The OptiBlend® kit can be installed on nearly any new engine and can be retrofitted to existing engines, which provides just about any facility with the security of dual fuel. There are no internal modifications to the engine or changes to the OEM controller needed to run with the added security and power of dual fuel. When an essential facility's grid power goes down, OptiBlend® allows for reduced concern over whether the diesel fuel supply will last through the outage, while providing more time to get additional diesel fuel delivered, should the outage continue long term.

Additionally, using a dual fuel system results in a longer running, less expensive to operate engine, as dual fuel technology makes engines with a diesel oxidation catalyst (DOC) run more cleanly. With OptiBlend® and a DOC installed, CO₂ is reduced by 11%, NO_x is reduced by 18%, particulate matter is reduced by 38%, and CO by 94%.

OptiBlend® would have been invaluable in some of these disasters, helping to avoid the need to transport critical patients or losing power in a crowded facility. Being able to displace some of the diesel fuel with natural gas is not only environmentally conscious, but also a cost-effective way to extend the runtime of an engine using the diesel supply already available.

OptiBlendFuels.com



How it works



OptiBlend® utilizes a specialized gas train consisting of a manual ball valve, a 25-mesh filter, an electric shutoff solenoid, and a zero-pressure regulator (ZPR).

The gas train feeds the mixer(s) via an infinitely adjustable throttle valve (butterfly-style) giving better control over the system than anything else on the market. These components offer multiple redundant shutoffs to stop the flow of gas: the throttle and the solenoid can be closed manually, the manual ball valve can be closed, and there is an E-Stop button that will de-energize the system completely. Additionally, by design, the ZPR cannot allow gas to flow unless it senses suction from the engine. This ensures natural gas is only ever drawn into the engine and never forced in under pressure which is inherently safer.



CONTROL PANEL / The PLC is NEMA 4X certified

There are no special tools required to install or operate the OptiBlend® kit and every setting can be changed via the Human Machine Interface (HMI) making over-the-phone technical support possible. Often, any issues that arise can be solved without a technician on site, which saves expense and minimizes downtime. All components are extremely robust, require very little maintenance, and are designed to stay on and in constant use, ready for immediate action for years.

The inherently safe nature of OptiBlend® has been proven over the past 10 years and the kit has never damaged or “torched” an engine. There is no loss in engine performance and the kit can handle large load swings without issue. OptiBlend® also can run field gas and can adapt in real-time to changes in the chemical makeup of that gas. And, lastly, if anything were to go wrong or the natural gas supply was cut, the engine will revert to 100% diesel and the OptiBlend® kit will go into standby until

the correct parameters are met to once again flow gas safely; there is no need for someone to go out and manually restart the OptiBlend® kit. The engines always run 100% diesel upon startup, retaining the quickness of traditional diesel generators in switchgear response. This is crucial in hospitals because they have a short window for the generators to come online and dedicated natural gas generators often cannot meet that specification.

Conclusion

OptiBlend® creates a better way to run traditional single speed diesel engines for a more secure and greener future by being able to simultaneously blend two different fuel sources. OptiBlend® extends the backup unit's runtime and mitigates some risk of the availability of a single fuel source.

The OptiBlend® system has been installed all over the United States providing vital facilities with the extended backup runtime & security that they need. Built robust and tough, it can reliably perform in almost any environment for years to come. OptiBlend® has been utilized in oil fields, fire departments, VA hospitals, U.S. Embassies, DoD facilities, and more. OptiBlend®'s ability to be installed on almost any new or existing engine offers the security of dual fuel to almost any end user.

The time to prepare for disaster is before it happens. Reach out to OptiBlend® today and gain the security of being able to power your facility longer, more cheaply, and more securely.

We sell and service our kits worldwide.

Please contact us for a quote or more information.

303.468.1705 | optiblend@edeninnovations.com

12395 Mead Way, Littleton, CO 80125



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