

# WHY CHOOSE A HYBRID POWER SYSTEM?

DISCOVER THE SCIENCE BEHIND A BATTERY ENERGY STORAGE SOLUTION (BESS) AND DIESEL GENERATOR HYBRID POWER SYSTEM — AND WHY THE BENEFITS OF THIS HYBRID POWER SYSTEM OUTPOWER A DIESEL-ONLY GENERATOR RUNNING 24/7.

To experience the interactive elements of this book on a **MOBILE DEVICE** or **TABLET**, please visit this [LINK](#).



**GENERAC** | **MOBILE**

# ENERGY FOR THE ENVIRONMENT.

A Generac hybrid power system combines our Mobile diesel generators with our BESS to deliver multiple advantages: lower carbon emissions, cleaner air, noise reduction, and operating cost savings. Use this book to better understand what a hybrid power system is, how our innovative system works, why it practically guarantees faster ROI and so much more.

## POWERING A SMARTER WORLD



RENTAL



CONSTRUCTION



OIL AND GAS



EVENTS



DISASTER  
RELIEF



ENVIRONMENTALLY  
FRIENDLY



01

02

03

04

05

06

## MAKE YOUR LEARNING COME TO LIFE.

As you explore this eBook, watch for and then click on “live” graphics and icons for a more informative, interactive experience.

**EXAMPLES OF INTERACTIVE ELEMENTS:**

**BUTTON**



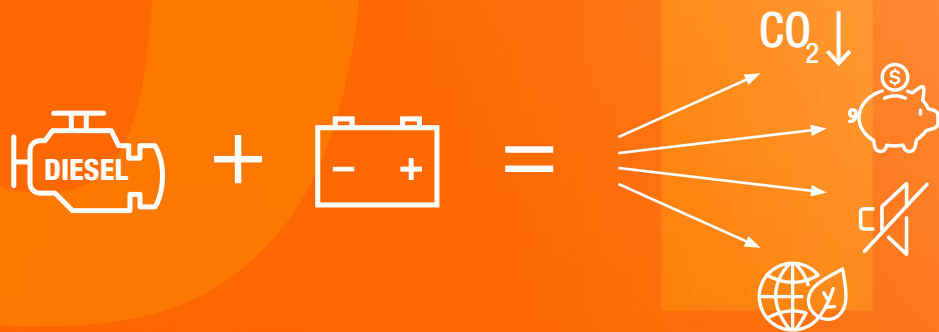
**Orange and/or underlined text**



# WHAT IS A HYBRID POWER SYSTEM?

**A hybrid power system can do it all.**

A Generac hybrid power system combines our Mobile diesel generators, or other energy sources like solar or hydrogen fuel cells, with our BESS to reduce generator runtime and fuel consumption, cut emissions, reduce carbon footprint, and lower noise — all without sacrificing performance. Higher fuel prices result in greater cost savings. A hybrid power system enables a diesel generator to work at its optimum efficiency while storing spare energy in a high-power battery backup.



# HYBRID POWER PERKS

Often, diesel generators on their own are oversized for the application and underloaded, spending much of their time running while doing very little work. This can lead to:

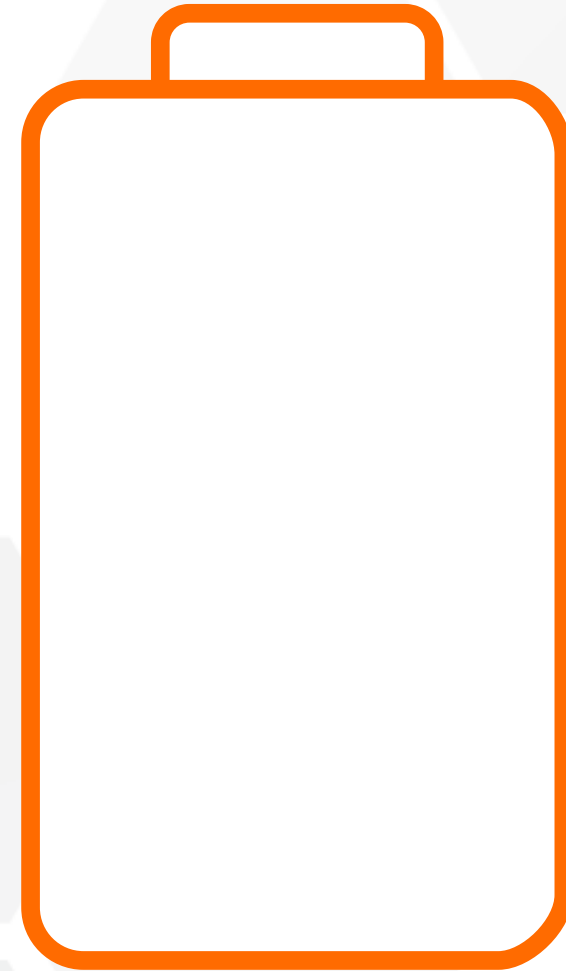
- Poor fuel economy
- Higher pollution levels and carbon emissions
- Loud, noisy operation
- Potential for wet stacking

# HYBRID HAS IT ALL

## ENHANCED EFFICIENCY.

When there's low demand for power, hybrid technology allows a generator to turn off so that only the battery supplies the power.

- When the battery runs low or demand for power increases, a BESS automatically starts the generator, which means it only runs when necessary — and at optimum efficiency.
- Plus, the BESS works together with the generator during times of high-power demand, allowing a smaller, more cost-effective generator to power the same load.





# HOW HYBRID POWER SYSTEMS WORK

## Introducing next-gen power.

A hybrid mobile battery energy storage solution is a highly versatile power solution for construction, events, utilities, remote locations, energy storage and a variety of other projects.



**SAVES  
FUEL**



**SAVES  
MONEY**



**REDUCES  
CARBON**



**LOWERS  
EMISSIONS**



**REDUCES  
NOISE**



# SAVE ON FUEL

## UNDERSTANDING HOW HYBRID POWER WORKS STARTS WITH KNOWING THESE SIMPLE STATISTICS.

Like any internal combustion engine, a generator's diesel engine works more efficiently at a steady, higher load compared to when lightly loaded. It's much the same as how a car uses more fuel per mile when being driven in town compared to when driving at speed (highway driving).

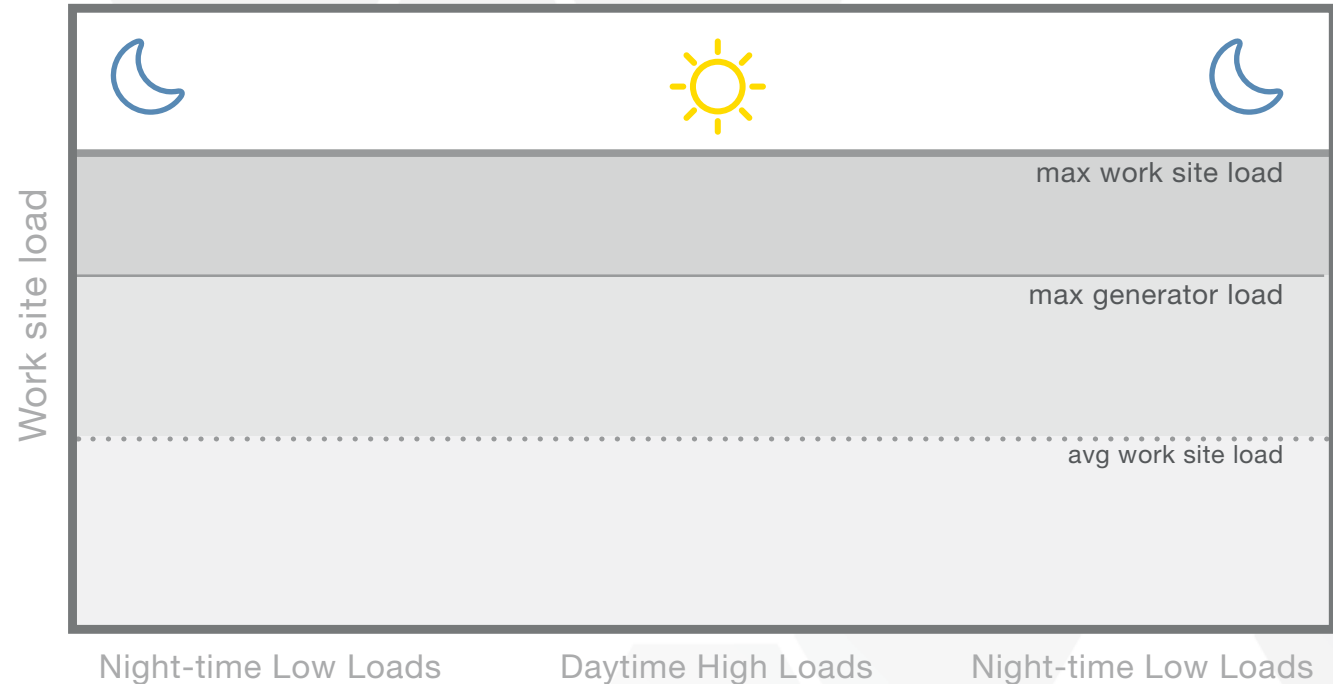
Up to five times more fuel is consumed to generate one kilowatt of energy at 10% load compared to working at 50% load or above. Because electricity is rarely consumed continuously, many traditional diesel generators spend most of their time running at a very low load, which leads to higher fuel usage and costs.



# IT'S ALL ABOUT **THE LOAD**

For a generator, we look at gallons burned per kilowatt hour generated.  
See how a generator's fuel economy rapidly falls when working at a low load.

# MORE EFFICIENCY, LESS FUEL



With a Generac hybrid power system, a generator will only run when there's work to do. Plus, its hybrid technology will only charge the battery when running at optimum efficiency.

When there's less work, the generator is turned off, and energy stored in the battery is then used. Even when energy conversion losses (called roundtrip efficiency) are accounted for, the result is less fuel consumed for the same amount of electrical energy generated.

# LESS FUEL **FOR MORE SAVINGS**

## IT'S SIMPLE.

Decreasing the amount of fuel consumed increases your financial gain.  
It goes far beyond every gallon of fuel not burned, too! Lowering fuel consumption means:

Fewer generator running hours will result in longer times between regular scheduled service intervals — helping you save on costs, reduce on-the-road time and have less maintenance expenses.



# ALL-AROUND **COST SAVINGS**

When you calculate fuel savings, as well as costs saved by moving to a smaller diesel generator, there's typically a significant savings, although it may depend on what you currently pay for diesel fuel.

Generac can run a cost-benefit analysis to determine upfront costs and long-term operational benefits to help you make a highly informed decision.

Consider a typical construction site that has a maximum load of 30 kW and uses a generator with a prime rating of 29 kW/36 kVA 24/7.

A Generac hybrid power system could save up to

— that's a 41% fuel consumption savings! Think of the long-term fuel and financial savings!

# REDUCE CARBON EMISSIONS

CO<sub>2</sub> emissions directly impact fuel savings. If we use the construction site example from the previous page, saving 84 gallons of diesel equates to a reduction of 1 ton of CO<sub>2</sub> emissions\* per week.

- 1.3 tons of CO<sub>2</sub> (hybrid) versus 2.3 tons (diesel generator) in one week.
- Or think of it like this: 1 ton of CO<sub>2</sub> avoided is like eliminating the emissions a pickup truck would emit driving coast to coast!

You'll be saving fuel, money and doing more to significantly lower carbon emissions ... a win-win-win!

*\*Emissions used with hybrid power system versus diesel generator alone.*

# BETTER COMBUSTION

When it comes to air quality, long-term diesel burning can be problematic. Studies show that a generator running under light load doesn't operate within optimum conditions, resulting in poor combustion.

This means that more pollution is being produced for the same amount of electrical energy generated, compared to when a generator is working hard. A hybrid power system either makes the generator work harder or will turn it off, creating many more efficiencies and far less pollution.



# CLEANER AIR

Did you know that large generators often operate under low load conditions? (For example, generators with optional, higher-cost onboard load banks that burn extra fuel versus using the same energy to recharge the BESS.) This is when an entirely unserviceable load burns electrical energy off into the atmosphere as heat to make the generator work harder and prevent wet stacking.

# GET RID OF THE RACKET

Battery storage systems make absolutely no noise, besides the whisper of a running fan, which is almost impossible to hear above background noise.

## **AVOID NIGHTTIME NOISE.**

Power is often needed in noise-sensitive locations like residential areas — where noise is sometimes not just an annoyance but prohibited! Hybrid power systems can be programmed so that running the diesel generator at designated times can be avoided altogether due to the BESS extending its working hours. This means zero noise and zero noise complaints, allowing work to carry on ... since no loud diesel generator noise will force operations to shut down.

# MORE HYBRID ADVANTAGES

Now that you know the positives of a hybrid power system, it's time to explore more powerful perks.





# THE PERFECT MIX OF ENERGY

Diesel generators and solar energy alone don't work well together. However, when you add battery storage systems into the mix, it creates an entirely different outcome.

Battery energy storage solutions provide a far more stable output than a generator. This means energy generated by renewables like solar can connect and contribute to saving the use of the battery. When solar PV is overproducing, this excess energy can be stored in the battery for later use, reducing generator running times and, in some cases, eliminating the need for a generator altogether.

# ANOTHER KIND OF CLEAN POWER

If you know anything about electricity and “power quality,” you know its supply can be unstable and distorted. Power created from a battery storage system is ultra-stable (“clean”) because it’s generated by electronics that react quickly to causes of disturbance, creating electricity that’s of the highest quality.

The BESS advantage is that its output is always clean, reliable, high-quality power — with low THD compared to some generators.

Entities such as broadcast or scientific research that use power in remote places greatly benefit from tapping into this clean energy source, rather than a diesel generator alone.

**POWER STABILITY**

# WORKING WITH **THE GRID**

Occasionally, a grid power supply might become available but is limited to a specific capacity. A far better alternative is battery storage, which can “top up” and assist the grid supply to cover these short-term peaks in demand. When load is low, the battery can then recharge from spare grid power.

## **TWO EXAMPLES OF THIS IN ACTION ARE:**

1. Powering temporary buildings such as construction site job trailers
2. Charging higher concentrations of electric vehicles at busy times of the day

# REAL-TIME DATA AND VISIBILITY.

**Knowledge is power.**

Knowing how much power you need or currently use can be transformational and critical to your ROI and ongoing success.



# MORE KNOWLEDGE, **MORE POWER**

Understanding your power usage numbers today lets you better manage the cost and set energy consumption goals for tomorrow.

A significant factor that sets hybrid power solutions apart from typical conventional diesel generation is giving you access to valuable information: energy consumption monitoring and reporting on a real-time basis.





# HYBRID POWER: STACKED VALUE

**A smart investment for your future.**

There are so many powerful reasons to choose a BESS and generator hybrid system, from saving fuel and reducing CO<sub>2</sub> to cutting emissions and eliminating noise. Plus, as you look ahead, you can take control of your energy use and find fantastic cost-saving opportunities.



# A HYBRID POWER SYSTEM **JUST MAKES SENSE**

Being clean, saving carbon and cutting noise are all commendable goals, but just as important is lowering your costs. Our hybrid power technology is already transforming industries such as utilities, construction, events, telecommunications and broadcast and is found in countless other applications around the world.

## **HYBRID POWER SYSTEM PERKS**

## **LET'S LOOK TO THE FUTURE.**

If you're ready to learn more about how to find significant savings and forward the environment through more efficient power generation, we're ready to help.

# POWERING A SMARTER WORLD

 800-926-9768

GET EMPOWERED

Generac Power Systems  
S45 W29290 Hwy. 59, Waukesha WI 53189

[GeneracMobileProducts.com](https://www.generacmobileproducts.com)  
800-926-9768

MBEbook2 REV 7/22

©2022 Generac Power Systems. All rights reserved.  
Specifications are subject to change without notice.

**GENERAC**<sup>®</sup> | **MOBILE**