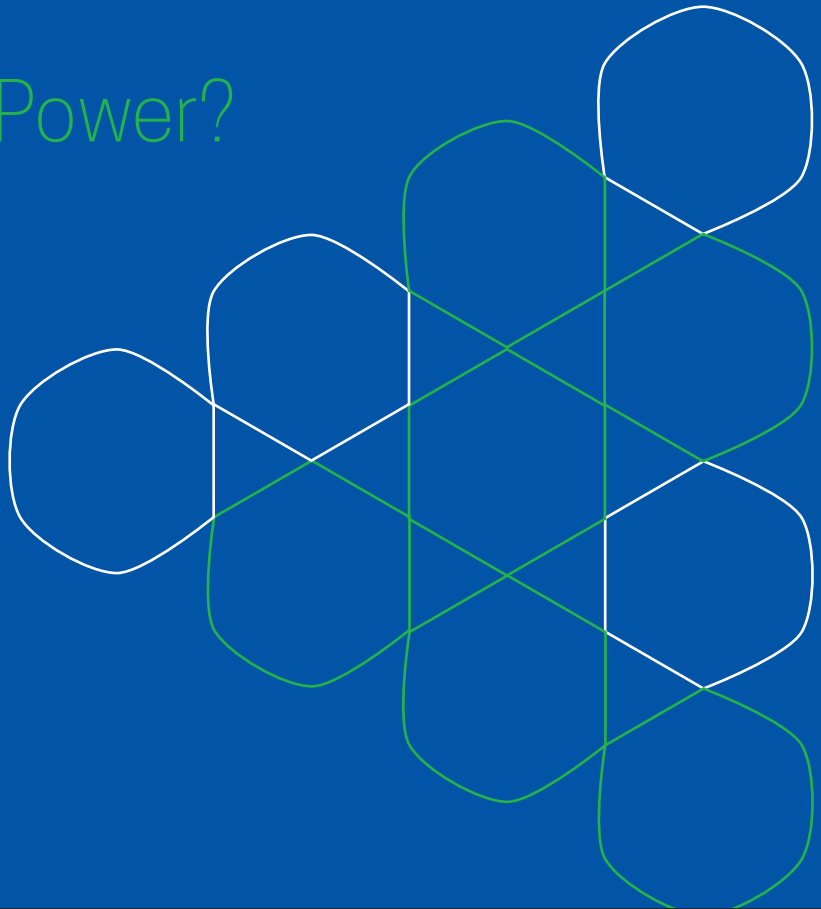
Why Choose Hybrid Power?

A matter of fact summary of the science behind hybrid power systems and the benefits compared to running a diesel generator 24/7.

For Construction, Events, Utilities, Remote Power and other temporary applications.



Hybrid power systems deliver cleaner air, lower carbon emissions and a reduction in noise, all whilst saving money. This pamphlet describes the principles behind hybrid power systems and sets out the benefits achieved.

What is hybrid power?

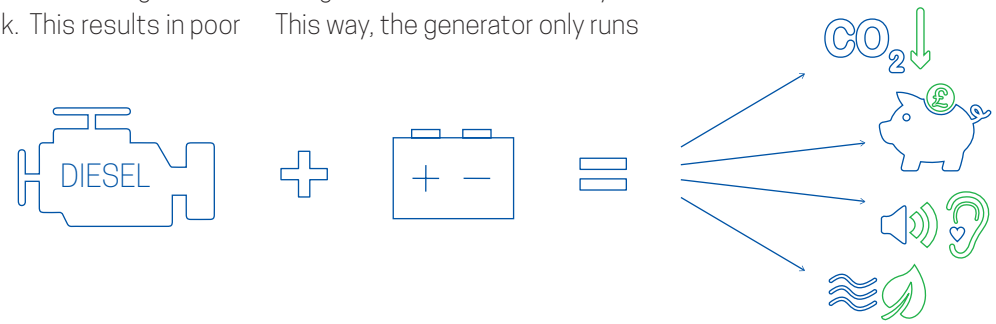
In much the same way as a hybrid car combines the use of a battery and an engine, to deliver fuel efficiency and environmental benefits, hybrid power systems combine a diesel generator with an energy storage system to achieve the same result.

More often than not, diesel generators are overrated for the job in hand and spend much of their time running but doing very little work. This results in poor fuel economy and unnecessarily high levels of pollution, carbon emissions and noise nuisance.

The introduction of hybrid technology means that, when there is a low demand for power, the generator can be turned off so that just the battery supplies the power. When the battery runs low or demand for power increases then the generator is automatically started. This way, the generator only runs when absolutely necessary and works efficiently when it does.

What is more, the battery can assist the generator during short bursts of high power demand, so a smaller generator can be used.

The result is a cleaner and more cost effective way of generating power with lower carbon emissions and less noise.



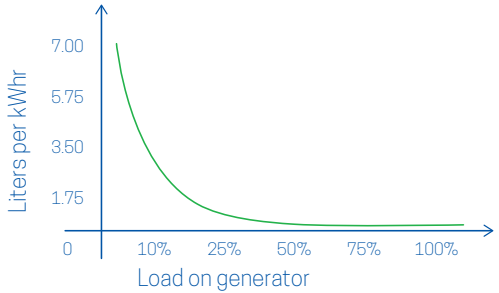
Saving fuel

(Why we don't rob Peter to pay Paul….)

There is a simple set of statistics behind hybrid power. As for any internal combustion engine, the diesel engine in a generator delivers poor fuel economy when lightly loaded compared to when it is working hard.

Much the same as a car uses more fuel per mile/kilometre when you drive around town compared to driving at speed.

For a generator, we look at litres burned per kilowatt hour generated. The graphic shows how a generator's fuel economy rapidly falls when working at low load. So, up to four or five times more fuel is consumed to generate one kilowatt hour of energy at 10% load compared to working at 50% load or above. In reality, because we rarely consume energy at a continuous rate, many generators spend most of their time running at very low load.



In a hybrid system, we only run the generator when there is work to do. We add to the work by charging the battery, making it burn fuel efficiently. When there is less work to do, we turn the generator off and use the energy stored in the battery. Even when we account for energy conversion losses (called round trip efficiency) the result is less fuel consumed for the same amount of energy generated.

So, it's not just a case of shifting fuel consumption to different times of the day; that's why we don't rob Peter to pay Paul!

Save fuel, save money

It's a pretty straightforward matter that less fuel consumed means you save money, every litre of fuel that is not burned represents a financial gain. It goes further than that, however. Less fuel consumed also means less frequent re-fuelling. If you really want to go the whole-hog, that also means fewer road journeys to refuel!

Fewer running hours means that generator service intervals are less frequent too, saving cost, reducing road journeys and creating less waste oil & materials.

When you calculate fuel savings, as well as the cost saved by switching to a smaller generator, there will be a net financial win.

In many cases savings can be significant, although one variable is what you save in money will, of course, depend on what you're paying for your diesel. If we were to consider a typical construction site as an example, that is running a 100kVA generator 24/7, a hybrid system could save between 500 and 1000 litres of fuel a week.

CO_2 Save fuel, reduce carbon

This bit is really simple. CO_2 emissions are directly linked to fuel savings.

If we use our construction site example from the previous page and go for the middle, saving 750 litres of fuel equates to 2.23 tonnes of CO_2 saved per week. That is more than an average family car produces in a year!

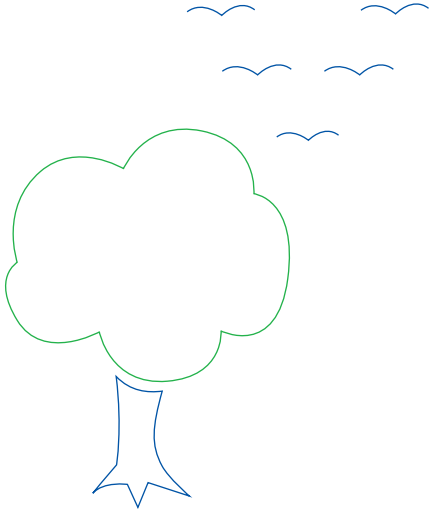
You could say that is the equivalent to taking more than 52 cars off the road altogether!

Better combustion means cleaner air

When it comes to air quality there's nothing good about burning diesel . To make matters worse, studies show that a generator running under light load does not operate within optimum conditions and this results in poor combustion. Poor combustion means that considerably more pollution is created, for the same amount of energy generated, compared to when a generator works hard. Hybrid power systems make the generator work harder then turn it off and so create much less pollution.

As a side matter, diesel engines operating inefficiently choke themselves through the sooty black carbon deposits, that collect in the exhaust, leading to further inefficiency and worse fuel economy - something of a vicious circle.

It's a matter of irony that large generators are often operated under load bank conditions (termed "banking") where an entirely pointless load that burns electrical energy off into the atmosphere as heat, to make the generator work harder and stop the engine sooting up! Hybrid systems load the generator to charge the battery then turn it off and use the energy stored; win-win!



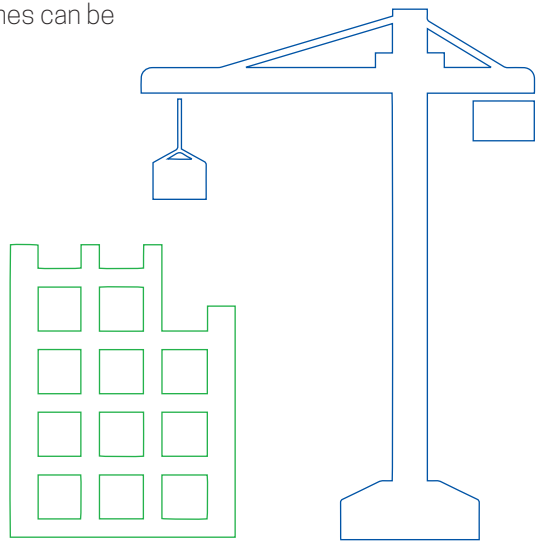
Reduce noise

The deafening sound of silence!

Generators are often described as “silent” or “super silent” in sales blurb. You can be your own judge of that, bearing in mind that silence is an absolute! Battery storage systems make no noise at all, other than the indeterminable whisper of a fan or two, if you could manage to hear that above the normal background noise.

Noise is, of course, subjective but you really can notice when a generator turns off. It is often the case that power is needed in noise sensitive locations such as a residential area where night-time noise would be an issue.

Hybrid power systems can be specifically programmed so that running the generator at designated times can be avoided altogether.



Other stuff

Already described are the primary benefits of switching to hybrid power systems. There are other considerations too;

The energy mix: It's a fact that diesel generators and solar energy do not mix well together and, in fact, what's the point!? Add battery storage, however, and it's another story. Battery storage systems provide a much more stable output than a generator and so energy generated by renewables can connect and contribute to saving use of the battery. Where solar PV is over producing, this excess energy can be stored in the battery for later use and further reduce generator running times and, in some cases, eliminate the need for a generator altogether.

The other kind of clean power: Those that know about electricity will understand how an electricity supply can be distorted and unstable. This is part of what is defined by "power quality". Even mains power is subject to a degree of disturbance. Power that is created from a battery storage system is ultra stable or "clean", because it is generated by electronics that react very quickly to causes of disturbance and so create electricity that is of the highest quality.

Applications such as broadcast and scientific research, when using power in remote places, can benefit from having this source of clean energy rather than a diesel generator.

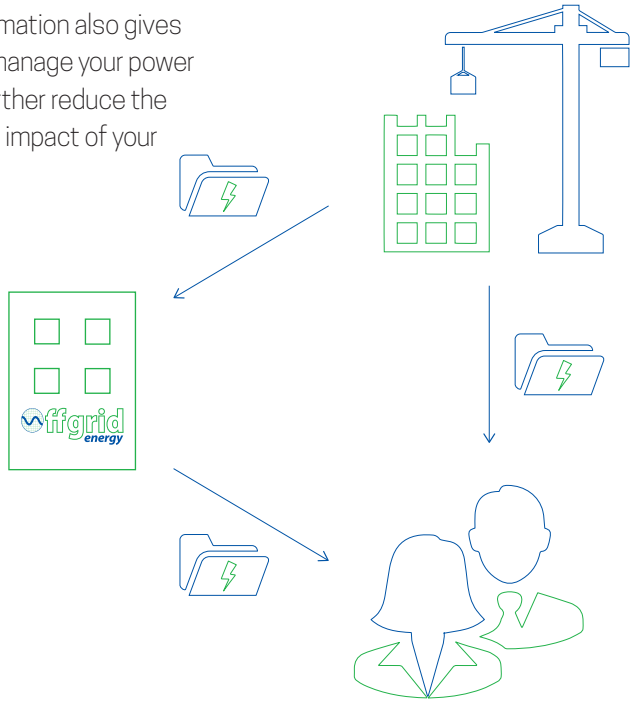
Working with the grid: Occasionally, a grid power supply might be available but limited to a specific capacity.
If, for short bursts, more power is needed than is available a decision might be made to discard the grid and use a generator instead. Battery storage can, as an alternative, work to "top-up" and assist the grid supply and cover these short term peaks in demand. When load is low the battery can re-charge from spare grid power.

Examples of this are the demands of tower cranes in our towns and cities or where concentrations of electric vehicles are being charged at specific times of the day.

Visibility and empowerment

Do you know how much power you actually need or use? There is a saying that "knowledge is power". If you can excuse the pun, knowing how much power you actually use and how you use it is transformational. It empowers you to effectively manage both the cost and impact of your energy consumption. A significant factor that distinguishes hybrid power solutions over conventional diesel generation is that we monitor and report your energy consumption on a real time basis and give you access to that information.

With real time data available, at your fingertips, you can make informed decisions and take control of your own power needs. As the start of a journey of improvement, this information also gives you a basis to start to manage your power consumption and so further reduce the cost and environmental impact of your energy consumption.



Putting all that together…

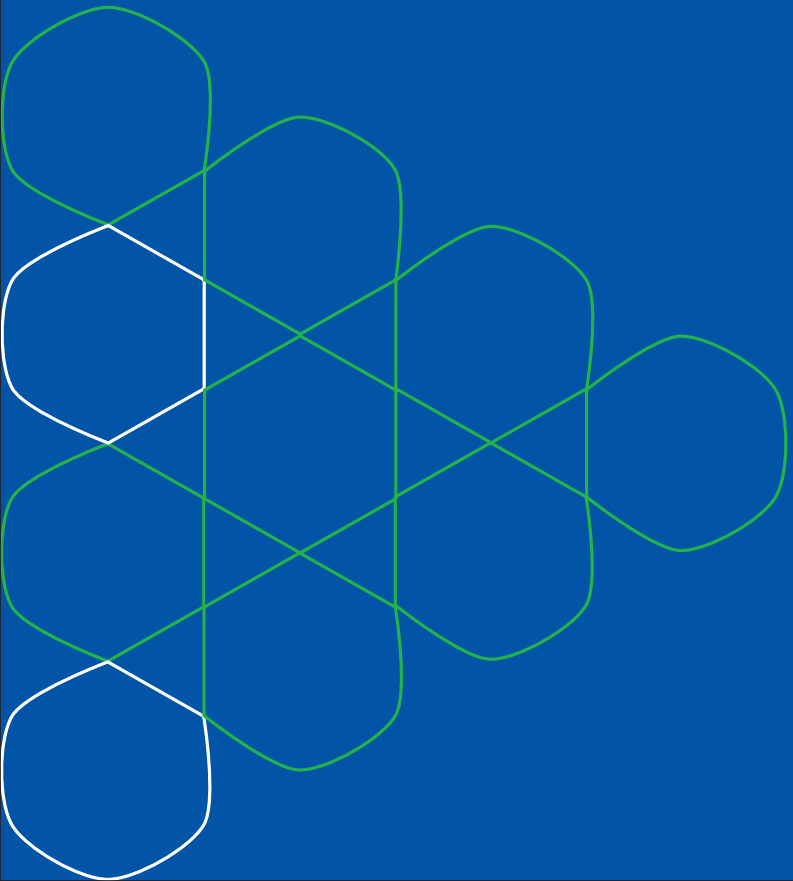
So, if we roll all that lot up, we can say that hybrid battery power systems save fuel, reduce CO_2, cut emissions and eliminate noise. You will also have control of your energy use and have a basis to manage strategy and policy.

Being clean, saving carbon and cutting noise are all important and commendable achievements but underpinning all of that with tangible financial benefit makes for a compelling argument.

Our technology is used widely in utilities, construction, events, broadcast and telecommunications as well as a host of other weird and wonderful applications.

Every situation is different, the scale of benefits will vary and each benefit will rank in different order but, ultimately, it makes sense.

If you want to know more about how you can make savings and impact the environment through more efficient power generation then our sales team will be happy to help. Why not join our growing list of blue chip customers already enjoying the benefits of hybrid power ?



offgrid energy

Off Grid Energy Limited

www.offgrid-energy.co.uk

01788 567 123

info@offgrid-energy.co.uk

hybrid power hire

Hybrid Power Hire Ltd

www.hybridpowerhire.co.uk

01788 222 288

info@hybridpowerhire.co.uk