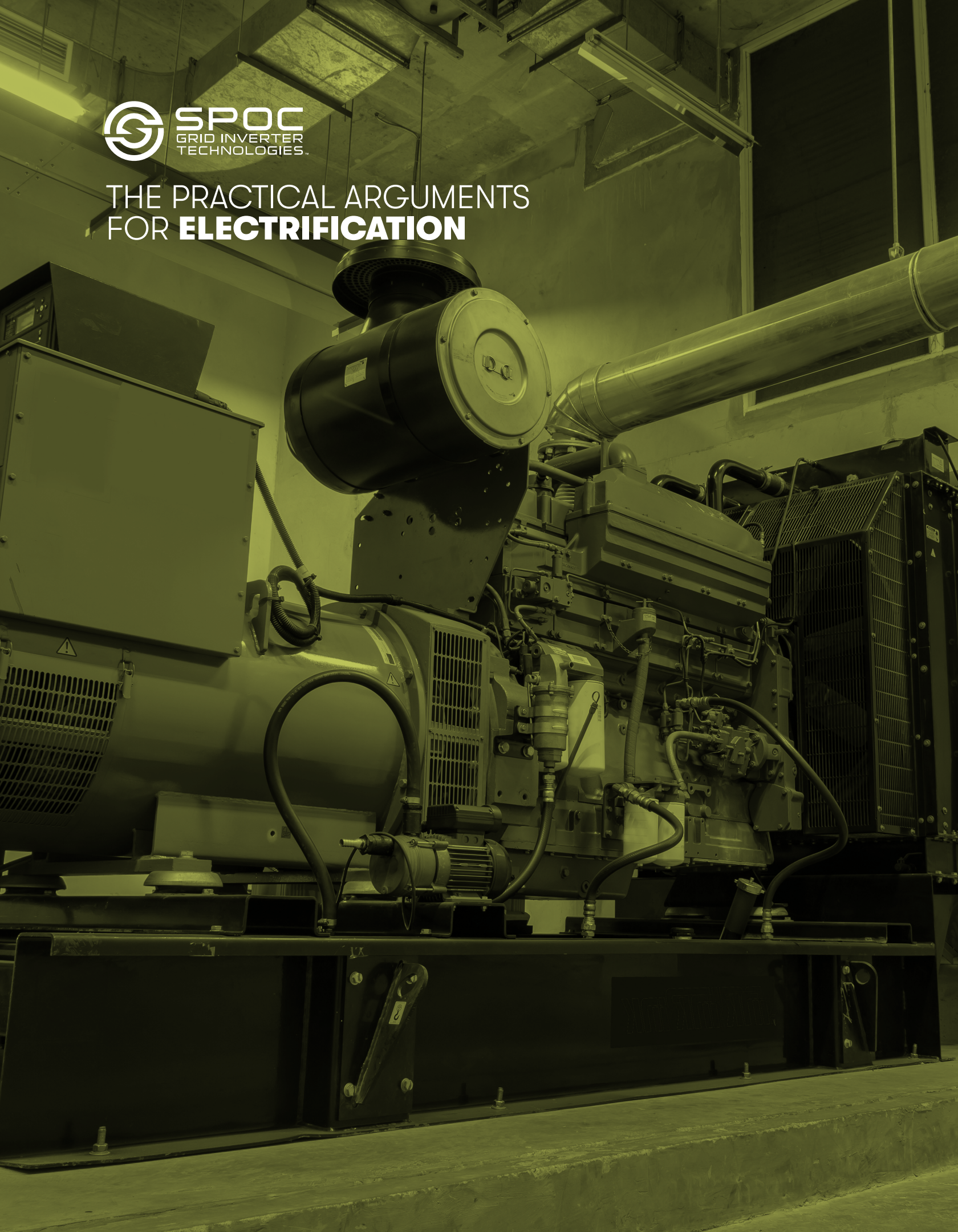
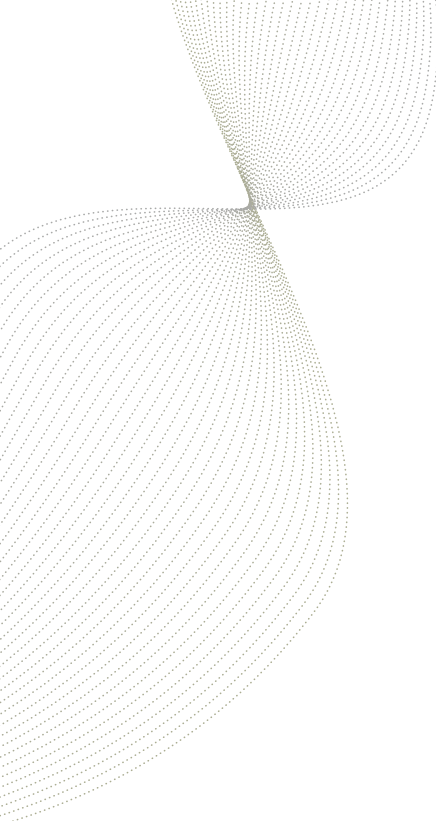




THE PRACTICAL ARGUMENTS FOR **ELECTRIFICATION**





When hybrid cars first came out, people were skeptical because they didn't understand the technology. We're seeing a lot of that today when we talk to people about electrification of industrial power too.

Granted, the confusion that exists around electrification is reasonable. The component technologies are complex, not to mention the system that results when you tie them all together.

Any time you approach a technology that you don't understand, there is risk and it's good to be aware of that risk. But there is also opportunity. And the more you investigate the technology that fuels hybrid power systems, the payoffs are so big that often the question changes from "Why should we?" to "Why wouldn't we?"



IT'S NOT ABOUT THE GREEN REVOLUTION

Hybridization is not about the Green Revolution, the Energy Revolution or the Carbon Revolution, though certainly you'll hear those phrases thrown around. Hybrid power is about taking existing industrial processes and doing them better. It's about the practical application of proven technology to create quantum leaps in efficiency in processes that haven't changed in decades.

Consider a simple genset on a construction site. Say it produces 1500 kWh from a gallon of diesel. What if, by adding batteries and power conversion technology, we could make it produce 2500 kWh? Wouldn't that be better?

The load on that genset is constantly changing, but with a traditional genset there isn't much you can do about it. But what if, by making it a hybrid, you could ensure that it always runs at its most efficient point on the load curve? So when loads are high, it does what it was originally designed to do. But when the power requirements are low, it still runs at its optimum load and puts the excess energy into the battery. And then when the battery was charged, you turned off the genset and run everything off of the batteries for 8-, 10-, 14-hours a day.

That hybrid machine would dramatically cut your fuel burn. As a consequence, it would slash your emissions. Wouldn't that be better than the way things are done today?

Now imagine that genset in a remote, even hostile environment, like a forward operating base. That hybrid might reduce the amount of fuel necessary to complete the mission. It might eliminate noise when you don't want noise. Again, wouldn't that be better?

And by making that machine a hybrid, you dramatically reduce the work it's required to do and the wear and tear it endures. Meaning you dramatically reduce the maintenance required to keep it working, and you potentially extend the life of that genset by 5-, 10-, 15 years. What would that mean to your ROI?

That's what hybridization is: A practical application of technology that produces the same result but uses far less resources.

Hybrid power is about taking existing industrial processes and doing them better. It's about the practical application of proven technology to create quantum leaps in efficiency in processes that haven't changed in decades.

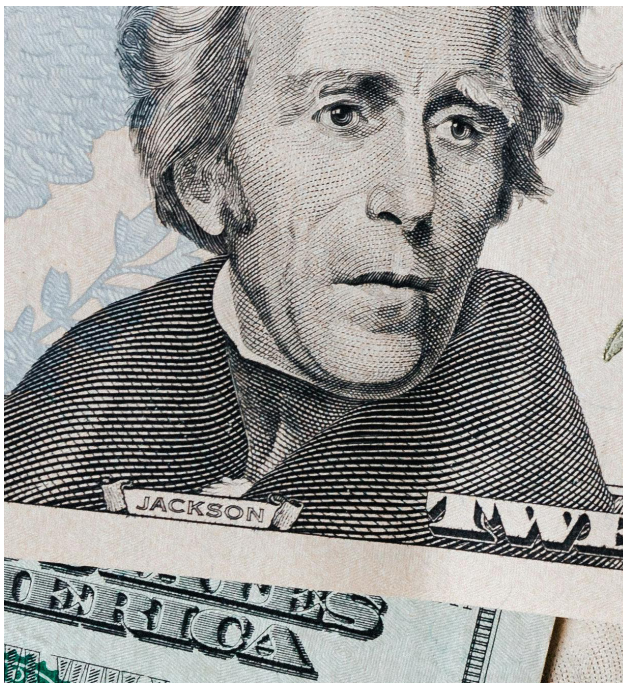
LET'S TALK ENVIRONMENTAL BENEFITS

Moving beyond a simple hybrid genset, industrial hybrid power system technology promises benefits across a number of fronts.

- **Reduce Greenhouse Gas Emissions:**

We've talked about this with a simple genset, but cutting emissions is a benefit that grows as the power system scales. Industrial applications are among the biggest contributors of carbon emissions. Slashing those emissions has practical benefits both locally and globally.

- **Decreased Air Pollution:** And of course, when you cut emissions you cut pollutants such as sulfur dioxide (SO₂), nitrogen oxides (NO) and particulate matter.



THE MONEY-MATH ADDS UP AS WELL

- **Cost Savings:** Yes, the initial investment for hybrid systems and renewable energy infrastructure can be high. But the long-term operational and maintenance costs are typically lower and often dramatically lower. The cost of renewable energy has been decreasing consistently, making it more competitive with traditional energy sources.
- **Energy Efficiency:** Hybrid systems don't just promise incremental gains in efficiency. Data from real-world applications show quantum leaps in efficiency, leading to dramatic reductions in energy consumption and operational costs.



AS IN INVESTING, DIVERSIFICATION LEADS TO MORE CONSISTENT RESULTS

- **Diversification of Energy Sources:** Hybridization allows industries to diversify their energy sources, reducing reliance on a single type of fuel and enhancing energy security.
- **Grid Stability and Flexibility:** The advance of so-dubbed ‘Smart Power’ can stabilize your power systems, making them more resilient to disruptions.

TECHNOLOGICAL ADVANCEMENTS, AKA, INNOVATION

- **Integration with Renewable Energy:** Almost all of the most promising benefits of hybrid power systems comes from innovations in the integration of diverse technologies. Think inverters. Think power conversion technology. It’s this technology that makes the integration of renewable sources like wind and solar, combined with batteries into one practical solution.



LET'S NOT FORGET THE REGULATORS AND POLICYMAKERS

- **Government Incentives and Regulations:**
Governments around the world are providing incentives for electrification and implementing regulations to limit carbon emissions, creating a favorable environment for the adoption of electric power generation.
- **Corporate Sustainability Goals:**
Companies are increasingly adopting sustainability goals and carbon reduction commitments, driving the demand for cleaner, electrified industrial processes. Doing 'good' while doing 'better.'



