



## MICROGRIDS AND SYSTEM ISLANDING



### GOING OFF-GRID DURING OUTAGES AND EMERGENCIES

Many businesses are dependent upon having a reliable source of power 24/7/365 and can be vulnerable to new utility-imposed power shut-downs. Even facilities with solar, with and without storage systems in place, discovered that during a grid shut-down, their solar system no longer worked, and storage depleted with no recharge capability. Although the processes and specific equipment used in different businesses vary widely, more than 83% of the energy goes toward the same three areas – heating, cooling, and lighting. Throughout the year, each is a critical component of running many businesses and often requires 100% uptime.

PATHION solves this problem with our DirectCore™ Energy Storage System (ESS) that offers a more cost-effective and sustainable power solution versus traditional utility or diesel generator-dependent electricity. PATHION delivers the complete package, including financing, installation, and system monitoring, thus ensuring resilient and reliable energy to facilities and businesses. It starts by collecting and analyzing the right data to deliver a solution that is utility resilient and provides clean energy while lowering daily energy costs.

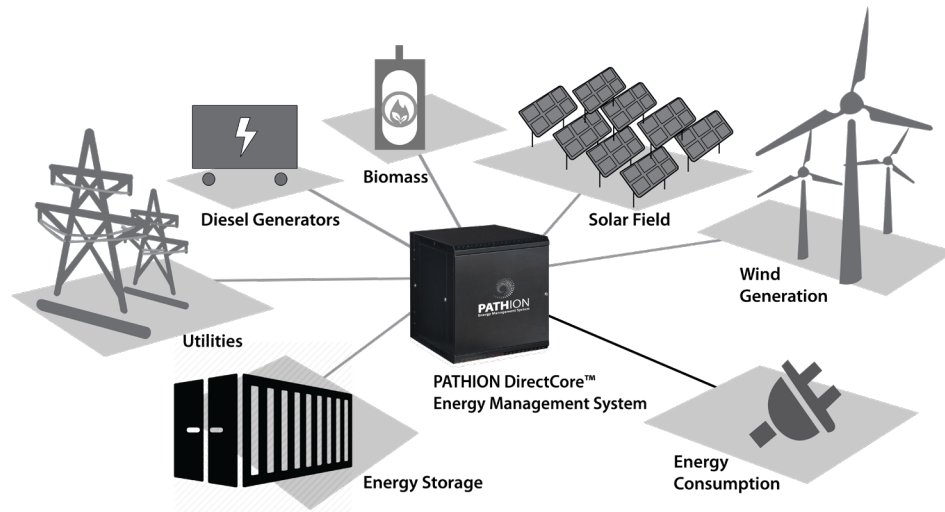
PATHION's advanced battery technology is optimized by the DirectCore™ Energy Management System (EMS) that automates the charging and discharging of locally-produced clean energy to deliver a safe and reliable solution. Our open system capability brings commercial, industrial, and local government sites the ability to control new or existing energy assets in real-time. The PATHION Energy Management System (EMS) provides continuous monitoring and control of the solar field or wind farm as well as batteries or diesel generators to deliver consistent energy demand to any critical or remote facility.

### PATHION ENERGY STORAGE: WHAT IS THE VALUE DIFFERENCE?

PATHION's DirectCore™ EMS optimizes energy supply and economics in a microgrid or building site setting by serving as the network hub. The EMS directs where, when, and how energy is transferred between various energy generating sources, the grid, and the end-user. Whether a single building or a broader facility area, these "local energy systems" are defined as either a small network of electricity users with a local source of supply that is generally attached to a centralized utility grid, or an off-grid configuration, (called islanding) in which the system functions without utility power to deliver all energy demands. In both cases, local energy can be generated from solar, wind, biofuel, fuel cell, combined heat, and power (CHP) systems, etc., and the local energy and loads can be optimized and balanced using the stored battery supply.

On the solar side, the EMS monitors each panel and controls each string in the array to optimize generation. If any panel starts to degrade or fail (or is subject to shading), the other





panels in its string continue to operate without being limited by the problem panel, while the problem panel identifies itself to the local control system. The problem panel can be replaced with any other manufacturer's panel – resulting in a heterogeneous grouping of panels all working together. Without a specialized solar panel interconnect and control technology, different manufacturers' panels can't work together. We solve this problem and eliminate the "Christmas tree light" problem – if one panel fails, the others continue to generate power. Our capability reduces supply risk should an original manufacturer's product become unavailable – a frequent phenomenon in solar panels.

DirectCore™ EMS can also integrate a variety of other generation and storage technologies to meet the needs of any operation. Predictive weather data can store or discharge wind energy as it becomes available. Diesel or RNG generators can be directly controlled to maximize efficiency when they are needed while minimizing fuel consumption. All this to ensure resilient power is always available when it is needed. Pair that resiliency with the considerable reduction of demand charges and add the potential of revenue generation and you have a truly compelling argument for acting while ITC credits are at their maximum.

A Microgrid designed and implemented by PATHION can ensure reliable system uptime, high efficiency, and low costs for the energy needs of any project. Microgrids can be an especially attractive option for sites with limited or unreliable grid connection, frequent weather disruption, remote geographical location, and sites with critical systems that cannot go down under any circumstance.

### ONLY PATHION SOLUTIONS CAN DO THIS:

- We maintain an energy heartbeat to allow renewables paired with storage to provide continuous power when the utility grid is down
- PATHION DirectCore™ EMS is compatible with virtually all renewable energy sources
- The DirectCore™ Platform is more efficient than alternative AC systems, with a 92% round-trip efficiency vs. 82% for alternative systems
- We feature a range of applications, including storage of solar energy to be used for more extended day/night periods, load matching, voltage regulation, and backup power
- We design and implement fully-featured microgrids in concert with our other technologies such as wind generation, EV chargers and conversion, and water treatment and purification systems

### How can we help you?

PATHION works closely with our customers to define their critical problems and find the best solutions, including offering insight on operations and processes both before or as part of a critical water and/or energy system upgrade. We then continue to support our customers throughout the life of the facility. Visit <https://pathion.com/contact/> to schedule an evaluation.