



PHOS GLOBAL ENERGY SOLUTIONS

TECHNOLOGY AND PRODUCT GUIDE

# PHOS KRONOS™

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Kinetic Hybrid Energy Storage & Grid Power Management Platform

SIMULTANEOUS POWER · UNLIMITED CYCLING · MULTI-DECADE INFRASTRUCTURE

ONE PLATFORM. THREE POWERFUL SOLUTIONS.

# PHOS ADVANTAGE™ ENERGY STORAGE LINEUP

## PHOS KRONOS™

Disruptive hybrid kinetic energy storage system that can charge and discharge simultaneously while delivering clean reliable power to your load.

## PHOS AEGIS™

Electrostatic energy uninterruptible power supply (UPS) built for data centers and other critical loads.

## PHOS TITAN™

Electrostatic energy storage systems for residential or commercial applications.

## THE OPPORTUNITY

# GRID STORAGE THAT DOESN'T WEAR OUT.

PHOS KRONOS pairs an advanced flywheel with high-power supercapacitors inside an integrated bidirectional power conversion platform — storage engineered as long-life grid infrastructure, not a consumable battery.

It absorbs and delivers power at the same time, cycles without electrochemical degradation, and is built for a service life measured in decades rather than replacement schedules.

The technology is already running: a 70 kW / 50 kWh pilot in New York powers a live facility today. PHOS is now inviting strategic partners into its next phase of deployment.

**30-yr**

DESIGN LIFE

**∞**

CYCLING ARCHITECTURE

**<1s**

TRANSIENT RESPONSE

**50 kWh+**

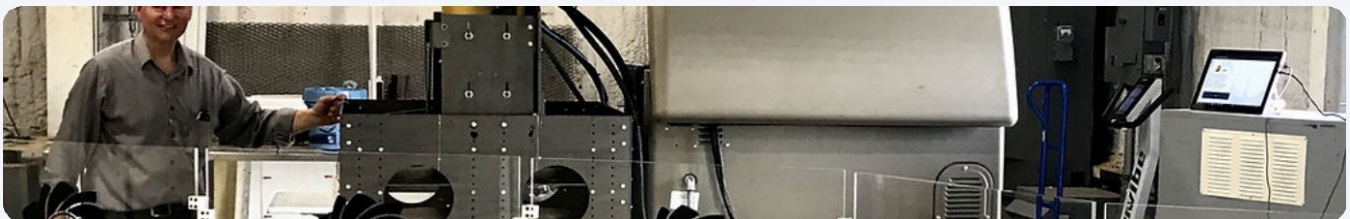
MODULAR → MULTI-MWH

## THE COMPANY

# ENGINEERING A MORE DURABLE KIND OF STORAGE SINCE 2018

PHOS Global Energy Solutions began in 2018 (originally 3B Energy), founded by a team set on rethinking energy storage around safety, longevity, and sustainability — removing the wear, short life, and safety trade-offs of chemical batteries and traditional flywheels.

The result was the KRONOS line, an advanced magnetic gearing and a modular design that store and discharge energy simultaneously, target a 30-year lifespan, and integrate seamlessly with renewables — today's PHOS Advantage.

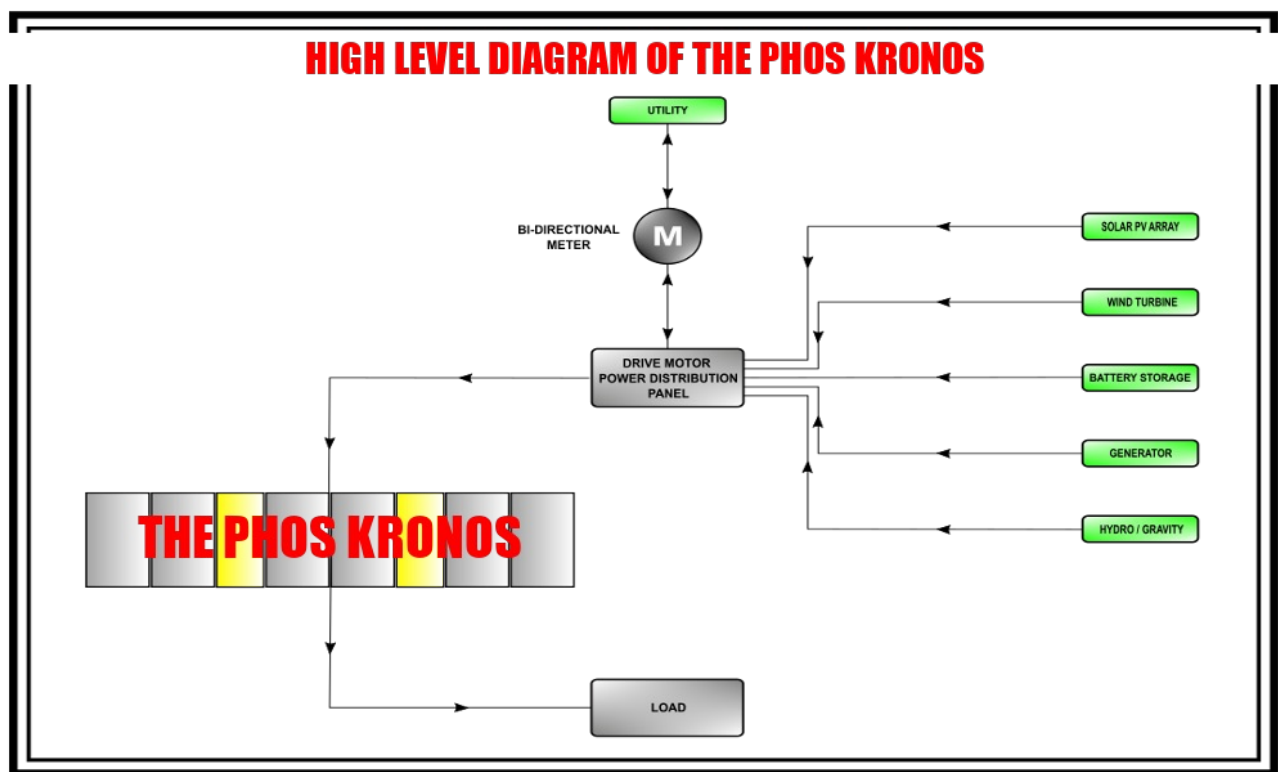


THE WORLD'S FIRST PATENTED, MODULAR, FULLY-SCALABLE ADVANCED FLYWHEEL ENERGY STORAGE SYSTEM — **STORING AND GENERATING ELECTRICITY AT ONCE, CONTINUOUSLY, WITH LITTLE TO NO DEGRADATION OVER A 30+ YEAR LIFESPAN.**

## HOW IT WORKS

# ONE BIDIRECTIONAL POWER PATH, BEHIND THE METER

PHOS Advantage sits between your sources and your load, coordinating utility, renewables, and generation in real time — with continuous power flow and no transfer event to the load.



Continuous bidirectional power flow — no transfer event to the load.

### FLYWHEEL

High-energy kinetic core provides bulk energy capacity.

### SUPERCAPACITORS

Manage fast transients and sub-second power events.

### POWER CONVERSION

Bidirectional PCS enables simultaneous charge and discharge.

## WHAT MAKES IT DIFFERENT

# FIVE ADVANTAGES, ENGINEERED IN

01

### **SIMULTANEOUS CHARGE & UNLIMITED CYCLING**

Absorbs input while delivering output in real time — an active grid buffer, not a passive store.

02

### **UNLIMITED CYCLING**

Kinetic architecture eliminates electrochemical wear: no cycle limits, no capacity fade, no calendar degradation.

03

### **30-YEAR DESIGN LIFE**

Patented magnetic gearing and a non-contact, levitated drivetrain minimize mechanical wear.

04

### **MODULAR & SCALABLE**

From 50 kWh base modules to multi-MWh installations — parallel architecture, no core replacement.

05

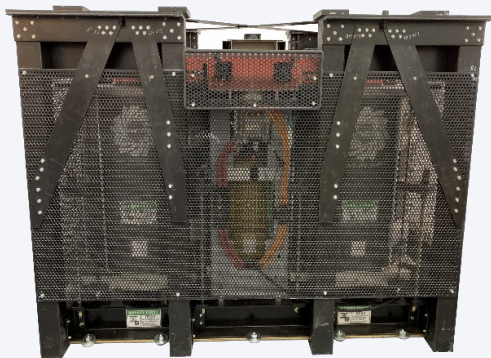
### **SOURCE-AGNOSTIC INTEGRATION**

Works across solar PV, wind, diesel and natural-gas generators, utility distribution, and islanded microgrids through a configurable PCS.

## PROOF IN OPERATION

# 70 KW / 50 KWH PILOT • NEWYORK

Operational validation on a live system — not a lab bench.



- Off-grid operation testing
- Continuous operation supplying a live facility
- Stable output under resistive & inductive loads
- Demonstrated simultaneous charge & discharge
- Higher-RPM endurance testing ongoing

## WHERE IT WORKS

# UTILITY & GRID APPLICATIONS

### RENEWABLE SMOOTHING

Mitigates short-term intermittency and ramp rates from solar and wind.

### FREQUENCY REGULATION

High-speed response for primary and secondary markets, including FERC-regulated and ancillary services.

### VOLTAGE STABILIZATION

Grid-edge voltage regulation and dynamic VAR support when configured.

### GENERATOR BRIDGING

Seamless transition between grid outage and backup generation.

### PEAK SHAVING

Reduces peak-load exposure while holding instantaneous power response.

### INFRASTRUCTURE RESILIENCE

Supports critical substations, municipal systems, telecom, and water treatment.

## WHY IT MATTERS

# A LONG-LIFE ASSET — NOT A CONSUMABLE

The value shows up over the life of the asset. Because performance doesn't degrade with cycling, PHOS competes exactly where conventional batteries struggle — high-throughput, high-cycle duty — and on lifecycle cost, not just up-front capacity.

### PHOS ADVANTAGE

- No cycle-based wear
- No capacity fade from throughput
- No calendar-based degradation
- 35-year design life

### CONVENTIONAL BATTERIES

- Cycle-based wear
- Capacity fade with throughput
- Calendar-based degradation
- Periodic replacement required

## INDUSTRIES SERVED

Utilities & grid operators

Solar & wind generation

Data centers & AI compute

Telecom & communications

Water & wastewater

Municipal & critical facilities

Healthcare campuses

Manufacturing & industrial

Microgrids & remote sites

EV charging hubs

Defense & government

## RESILIENCE & CONTINUITY

# CARRYING CRITICAL LOADS THROUGH THE WORST DAYS

When the grid fails or turns unstable, PHOS Advantage keeps critical power flowing — seamlessly through the disturbance, and for as long as the event lasts.

### THROUGH THE DISTURBANCE

- **No transfer event to the load.** Power flows continuously — protected loads never see the interruption.
- **Instant response.** Sub-second reaction to faults, faster than mechanical transfer switches.
- **Ride-through.** Absorbs sags, surges, and disturbances that trip sensitive equipment.
- **Generator bridging.** Holds the load while backup generation starts and synchronizes.
- **Voltage support.** Stabilizes voltage during faults and switching events.

### FOR THE DURATION

- **Islanding.** Disconnect from an unstable grid and run critical loads on local resources.
- **Unlimited cycling.** Buffers a solar-plus-generator microgrid continuously, with no wear.
- **Sustained through the event.** With on-site generation and renewables, power stays up through multi-day outages.
- **Built to run hard.** No degradation from repeated deep events — storm after storm, year after year.
- **Fuel-efficient backup.** Lets generators run at optimal load, cutting runtime and fuel over long events.

PHOS IS THE SEAMLESS, HIGH-CYCLE BUFFER; GENERATION AND RENEWABLES SUPPLY THE ENERGY — **TOGETHER, A MICROGRID THAT STAYS ONLINE.**

## BUILT FOR DATA-CENTER-SCALE LOADS

As AI and cloud drive record electricity demand, PHOS supports the facilities behind them — ride-through and generator bridging, peak- and ramp-management for volatile compute loads, and behind-the-meter renewable firming to ease interconnection constraints and defer grid upgrades.

## SUSTAINABILITY & LIFECYCLE VALUE

# CLEAN BY DESIGN — ECONOMICAL FOR DECADES

Kinetic storage sidesteps the environmental and financial burdens of electrochemical systems. PHOS Advantage is engineered to be a clean asset *and* a low-cost one across its full-service life — an advantage that compounds over decades of operation.

### ENVIRONMENTAL SUSTAINABILITY

- **No hazardous cells.** Nothing to mine, source, or send to landfill at end of life.
- **No fire risk.** Kinetic storage has no lithium thermal-runaway failure mode.
- **Less embodied waste.** One 50-year asset replaces multiple battery generations.
- **Enables renewables.** Smooths and firms solar and wind to displace fossil peaking.
- **Assembled in the USA.** Domestic design.
- **Less thermal pollution.** Reduces reliance on water-cooled peaking generation, helping cut cooling-water withdrawals and thermal discharge.

### LONG-TERM COST SAVINGS

- **No replacement capex.** The core never needs periodic battery swaps.
- **Lower maintenance.** A non-contact, levitated drivetrain reduces service.
- **No capacity fade.** Performance and revenue stay flat for decades.
- **Lower cost per MWh.** Spread across far more lifetime throughput.
- **Utility-aligned life.** Plan around a multi-decade asset, not a replacement cycle.

SUSTAINABILITY AND ECONOMICS PULLING THE SAME DIRECTION — ONE ASSET THAT IS CLEAN, SAFE, AND LOW-COST FOR 50 YEARS.

PLATFORM AT A GLANCE

# TECHNICAL SUMMARY

|                 |                                               |
|-----------------|-----------------------------------------------|
| ENERGY CAPACITY | Modular, starting at 50 kWh                   |
| POWER RATING    | Application configurable                      |
| CYCLE LIFE      | Unlimited cycling architecture                |
| RESPONSE TIME   | Sub-second transient management               |
| ARCHITECTURE    | Hybrid flywheel + supercapacitor              |
| INTEGRATION     | Grid-tied and microgrid compatible            |
| EXPANSION       | Scalable to multi-MWh deployments             |
| DEPLOYMENT      | Containerized options; substation integration |

Specifications are configurable to application and subject to change as the platform scales.

THE PARTNERSHIP

# PREPARING THE NEXT PHASE — WITH PARTNERS

PHOS is ready for structured pilots, transparent data sharing, and engineering collaboration. We’re seeking partners who gain most from storage that cycles hard, lasts decades, and pairs naturally with renewables:

**UTILITIES & GRID OPERATORS**

High-cycle relief for congested, peak-constrained grids — without degradation.

**RENEWABLE DEVELOPERS & IPPS**

Firm solar and wind and improve project economics with off-peak storage.

**INFRASTRUCTURE INVESTORS**

A 50-year, low-maintenance, utility-grade asset with predictable economics.

**CRITICAL-INFRASTRUCTURE & TECH PARTNERS**

Co-develop deployments and resilience for data, telecom, water, and municipal sites.

**AN OPEN INVITATION**

Visit our R&D department in Stony Brook, New York to see the patented innovation in person, and explore deployments where off-peak storage plus renewable injection can directly ease congestion and peak-delivery demand.

## CREDENTIALS

# CERTIFIED, PATENTED, BUILT IN THE USA



SAM · UL · NYSERDA · MADE IN AMERICA · NY-BEST+

MULTIPLE PATENTS ISSUED & PENDING

## LEADERSHIP

# THE PHOSTEAM

### BETTY MASTOROS

President, CEO, Co-Founder, Investor

### BOB BAKALIS

Co-Founder, Investor

### VICTOR BICA

Project Manager, Inventor, Co-Founder · Director of Manufacturing

### EUGENE RUDOLPH

Chief Mechanical Engineer, Inventor · Director of R&D

### ANDREW STESZYN

Chief Electrical Engineer

### EMMANUEL VOUMVOURAKIS

Mechanical Engineer · Director of Business Development

### MICHAEL SEREMETIS

Senior Executive Advisor

### JOHN GALIOTOS, PHD

Senior Executive Advisor

### KEVIN KOUBEK

P.E., Electrical & Mechanical Engineer

### ROYSTON RECHEA

Journeyman Electrician

### NATHAN WEBER

General Counsel

# LONG-LIFE KINETIC STORAGE FOR MODERN GRID DEMANDS

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