



LOW-COST, INDUSTRIAL ENERGY STORAGE FROM WASTE LEAD-ACID BATTERIES



INGENIOUS WASTE BATTERIES IES PROJECT

A new approach to energy storage:

Modern companies face increasing demand for affordable energy, making energy consumption optimization a key business strategy to reduce costs and improve efficiency. Affordable energy enhances competitiveness, financial stability, and job creation.

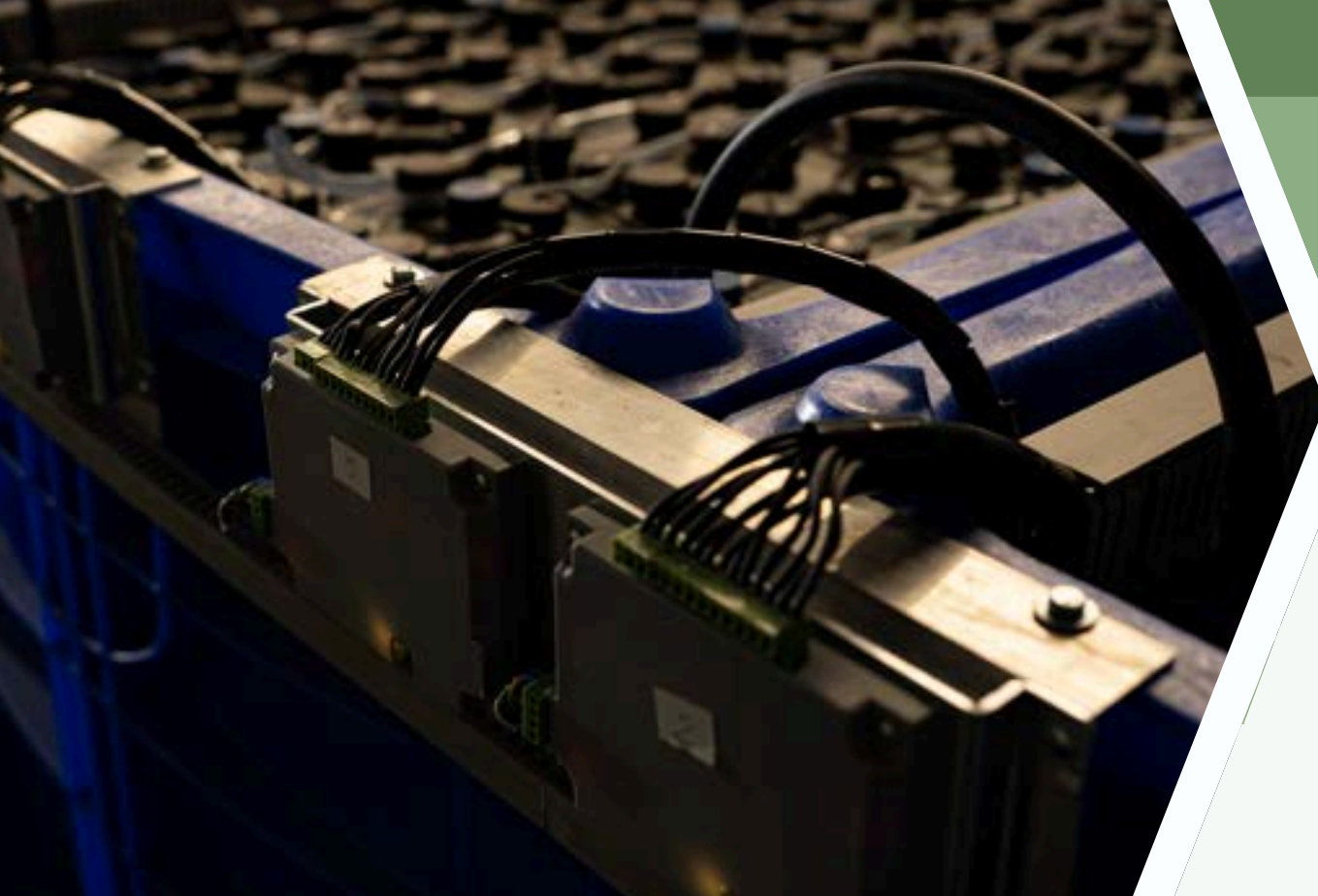
The teams of **Global Quantum**, **ASH**, and **ZUK "HAK" Stanisław Burczyński** present the **Ingenious Waste Batteries IES Project**, aimed at revolutionizing energy storage by regenerating used lead-acid batteries into cost-effective, high-capacity systems. Combining battery regeneration, proprietary cell balancers, and **BMS software**, we address key energy management challenges.



Milestones Achieved

We developed specialized equipment to regenerate 15 traction batteries (48 V, 775 Ah) using our asymmetric electrochemical synthesis technology. Initially, we aimed to create a 200 kWh system, but as the project evolved, we built a **502 kWh system with a discharge power of 100 kW**, using 15 regenerated batteries.





TO IMPROVE SAFETY

We replaced metal casings with non-conductive containers, reducing electrical shock risks. The system consists of nine modules with voltage-balancing devices for cell efficiency. A **100 kW high-current inverter** and a distribution board manage energy flow from batteries, balancers, photovoltaics, and grid inputs. Our **BMS software** automates charging, discharging, and energy purchases based on consumption patterns.



10 YEARS WITH PROPER MAINTENANCE

After testing, the system charges to its full **502 kWh capacity**, discharges at **100 kW**, and maintains stable voltages. Preliminary results indicate a reliable lifespan exceeding 10 years with proper maintenance.

COST EFFICIENCY AND MARKET POTENTIAL

The 502 kWh energy storage costs 80,000 EUR, compared 250,000 EUR for lithium-iron-phosphate storages. Our cost-effective, eco-friendly solution makes energy storage accessible and scalable for businesses.

FUTURE PROSPECTS

We plan to scale up to larger **1 MWh systems** while maintaining cost advantages. As we continue testing, we are confident in reshaping energy management for businesses.



MIEJSCA	
Połączenie DEBUG	
Licznik główny Janitza	BMS
KEHUA	Falownik
Techniczne	Licznik PV
Licznik Magazyn	

Licznik PV		
Połączenie DEBUG		
Prąd PV (66)		
L1 (69)	L2 (68)	L3 (70)
70.120 A	69.440 A	69.680 A
Napięcie (94)		
L1 (91)	L2 (92)	L3 (93)
234.8 V	234.8 V	235.1 V
Częstotliwość (95)		49.97 Hz
Moc czynna (96)		
L1 (100)	L2 (101)	L3 (102)
-16.4 kW	-16.2 kW	-16.4 kW
		L1/L2/L3 (103)
		-49.00 kW
Moc bierna (97)		
L1 (104)	L2 (105)	L3 (106)
0.1 var	0.4 var	0.1 var
		L1/L2/L3 (107)
		6.0 var

**OUR SUCCESS HIGHLIGHTS OUR COMMITMENT TO INNOVATION AND SUSTAINABILITY,
OFFERING A PRACTICAL AND SCALABLE SOLUTION TO TACKLE ENVIRONMENTAL
CHALLENGES AND SUPPORT A GREENER, MORE SUSTAINABLE FUTURE.**



Global Quantum Sp. z o.o. SK

an experienced company
implementing industrial RES
solutions and battery regeneration

the main developer of the solution
and project leader



ASH Sp. z o.o.

a company specializing in the
distribution and implementation
of advanced building automation systems

engaged in the development of
energy storage software



ZUK "Hak" Stanisław Burczyński

is an enterprise dedicated to the
collection and disposal of waste,
including hazardous waste

engaged in the supply of batteries

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