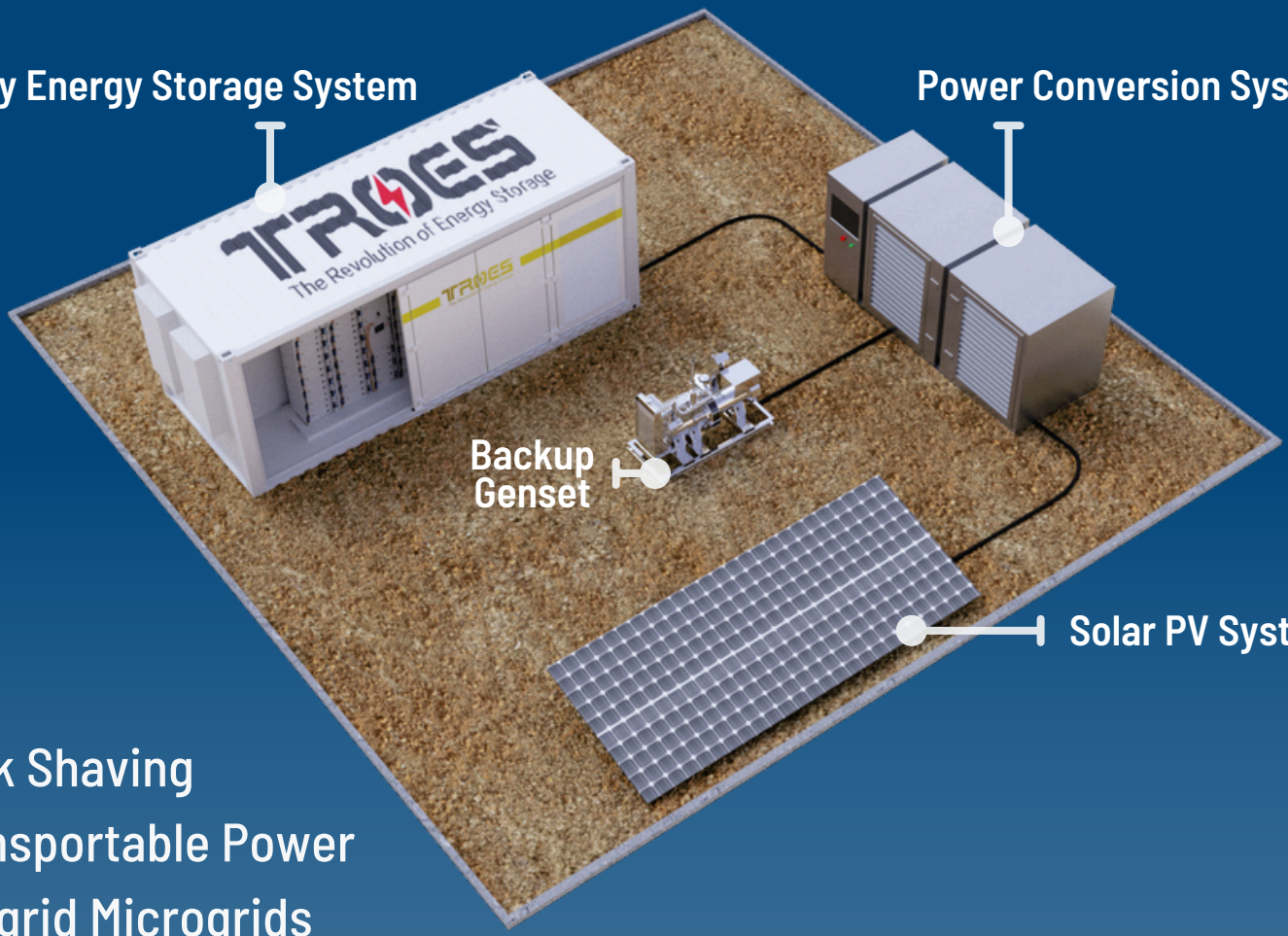
Case Studies

MICROGRID SOLUTIONS

Learn about real-world examples showcasing how TROES' microgrid solutions are fostering resilience, reducing carbon footprints, and bridging the gap to universal energy access.



Peak Shaving
Transportable Power
Off-grid Microgrids

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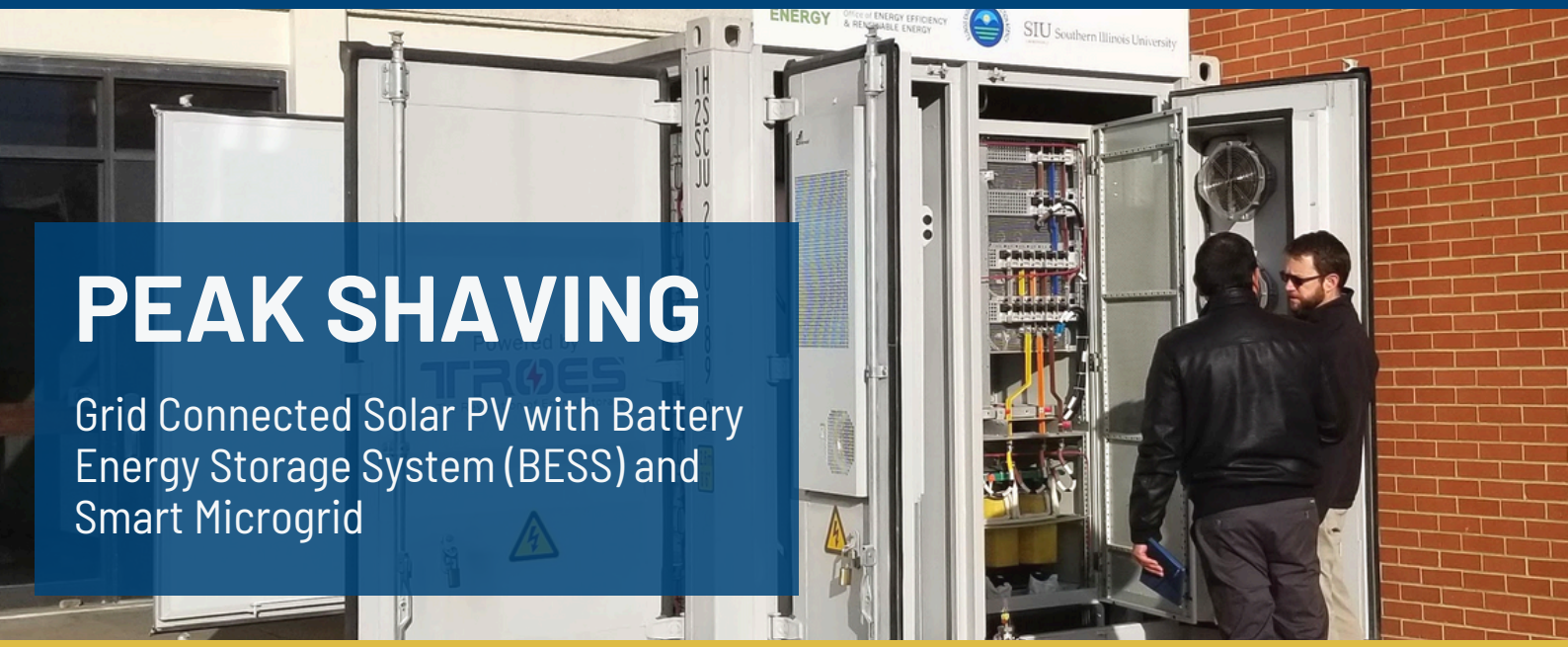

PEAK SHAVING

Grid Connected Solar PV with Battery Energy Storage System (BESS) and Smart Microgrid

PROJECT ABSTRACT

TROES optimized energy costs at Southern Illinois University by combining Solar PV with a Battery Energy Storage System (BESS), streamlining solar energy usage. With a $150,000 investment and a 3.5-year payback, this study showcases the effectiveness of peak shaving.

CLIENT CHALLENGE

Southern Illinois University clients are concerned about escalating energy expenses driven by consumption and demand charges. High-power buildings incur costly demand charges due to intensive short-term energy usage, reflecting similar challenges in nearby manufacturing and commercial sectors.

PROJECT SPECS AND PARAMETERS

Enclosure:
Outdoor 10ft. Container

TROES Battery Capacity:
100kW/250kWh, Hybrid Inverter

Building Type:
Manufacturing and Commercial Buildings

Key Components:
Solar and BESS, Control Software

Function:
Peak Shaving, Renewable Self-Supply, Resilience

Location:
Carbondale, IL, U.S.

TROES is the preferred solution for a hybrid Battery Energy Storage System alongside on-grid solar, guaranteeing power during peak hours, efficient recharging, and dependable nighttime load support, including backup support during blackouts.

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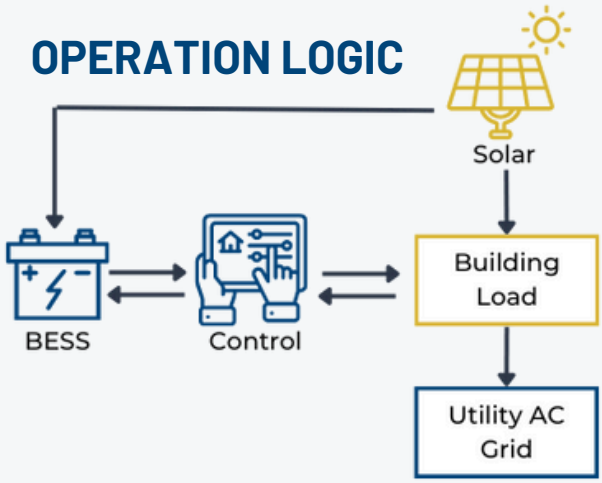
TROES' SOLUTION

Our sustainable solution integrates a wireless communication Battery Energy Storage System, a superior alternative to diesel generators. Solar PV integration maximizes efficiency, facilitating adaptable power generation to meet peak demand fluctuations, thereby enhancing overall efficiency.

OPERATION LOGIC



Solar Power Generation: Solar panels generate electricity from sunlight.

Building Load

Building Load Consumption: Electricity generated by solar panels is directed to meet the immediate power needs of the building.

BESS Interaction:

- Surplus solar generation is stored in the BESS for future use.
- In cases of insufficient solar generation, the BESS supplements power to meet demand.

Control Software:

- BESS charging during surplus solar generation or low building load.
- BESS discharging during high building load or insufficient solar generation.

Utility AC Grid

Utility AC Grid Interaction: Excess solar power beyond building demand and BESS storage capacity can be exported to the utility grid.

PROJECT RESULTS

Efficiency, backup support, and cost savings achieved with BESS + Solar PV + Smart Microgrid.

Initial Project Cost: US $150,000

Customer Type: US-Based Project Developer & EPC Firm/University

End User: University

Project Timeline: April 2021 - June 2021

Estimated Payback: ~3.5 years

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TRANSPORTABLE POWER

Solar + Energy Storage +
Fast EV Charging

PROJECT ABSTRACT

Our project creates a portable fast EV charging station with a 1.3MWh BESS, serving nonurban areas and facilitating peak shaving across sectors. Situated in California, U.S., our focus is on sustainable transportable power and energy access, in partnership with a U.S. EPC company.

CLIENT CHALLENGE

Public EV direct current fast charger infrastructures are insufficient, with demand constantly increasing. Many industries are looking for flexible, inexpensive charging solutions, including our client.

PROJECT SPECS AND PARAMETERS

Enclosure:
Portable Battery Energy Storage System Truck/Train Design

TROES Battery Capacity:
240kW/1.3MWh

Building Type:
Nonurbanized locations, Agriculture/Farming. Peak Shaving: Manufacturing and Commercial Buildings, Educational Institutions, Recreational Centers

Key Components:
Transportable Fast EV Charger, Solar Panel, Energy Storage, Control Software

Function:
Portable EV Charging, Solar Array Rechargeable

Location:
California, U.S. - Industrial Application

TROES, in collaboration with our U.S. partner, was selected for the renewable transportable power project due to our highly modular, transportable, and flexible design with advanced software, offering a seamless, remotely operated turnkey solution.

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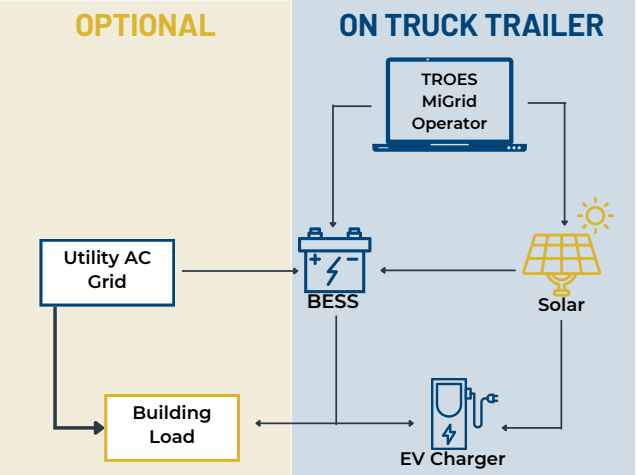
TROES' SOLUTION

TROES and our U.S. partner developed a high-capacity portable fast EV charging station equipped with a 1.3MWh BESS, rechargeable via a 60kW solar array or grid connection. Tailored for nonurban areas needing energy access, this transportable power solution benefits agriculture and farming industries as well.

OPERATION LOGIC



MiGrid Operator: Real-time visualization of power flower in microgrid, remote control ability.

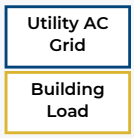
Solar Panels:

- Supplies energy to the EV Charger and BESS.
- Charges the BESS during periods of ample sunlight to maximize energy storage.

EV Charger: Receives power from solar energy or directly from the BESS.

BESS Interaction:

- Stores excess energy from solar panels or the Utility AC Grid.
- Provides power to the EV Charger and building load (optional) during low solar generation or high demand.



Utility AC Grid & Building Load [Optional]: Utility AC Grid supplements power to the BESS and building load during low solar generation or high demand.

PROJECT RESULTS

- Transportable EV Charging Station + Peak Shaving achieved with BESS + Fast EV Charger + Solar Panel
- **Initial Project Cost:** Confidential
- **Customer Type:** US-Based Project Developer & EPC
- **End User:** Local Energy Commission
- **Project Timeline:** July 2022 - May 2023
- **Estimated Payback:** ~6 years

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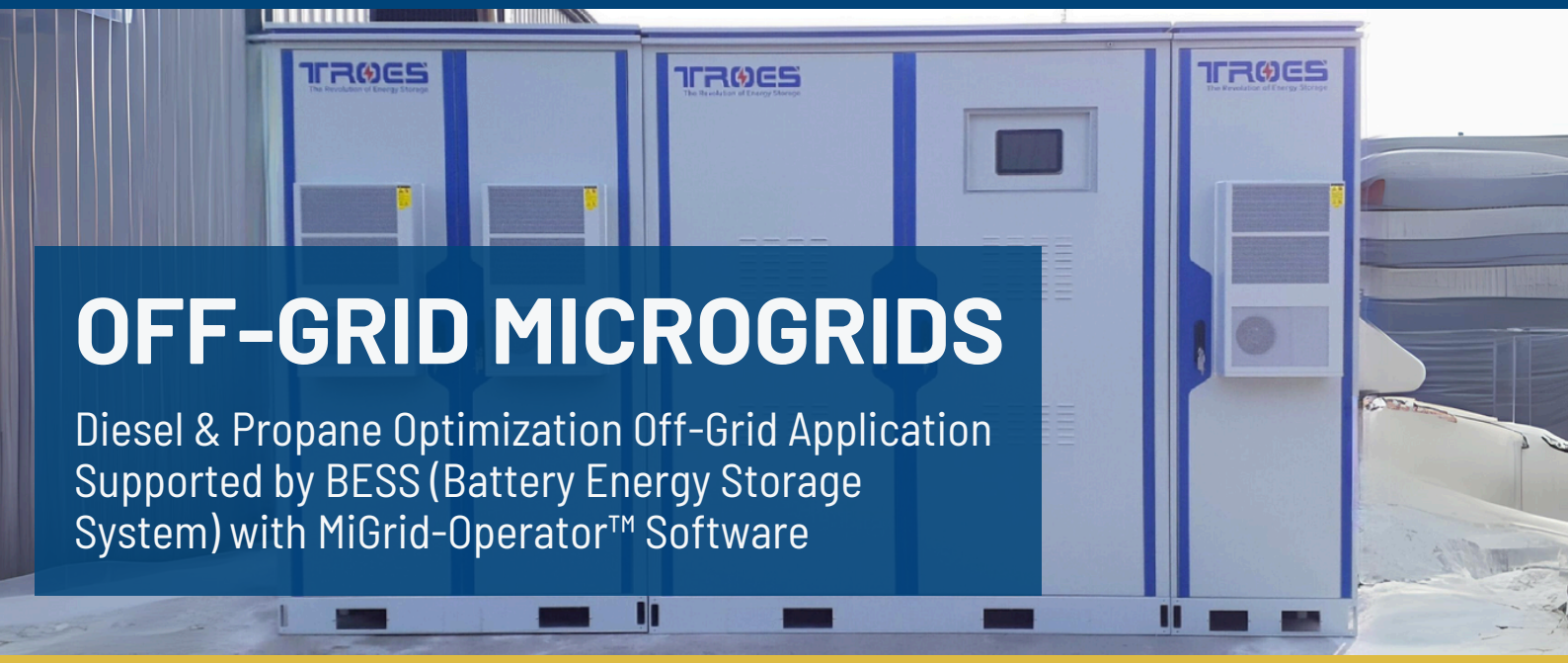

OFF-GRID MICROGRIDS

Diesel & Propane Optimization Off-Grid Application Supported by BESS (Battery Energy Storage System) with MiGrid-Operator™ Software

PROJECT ABSTRACT

TROES optimizes off-grid diesel usage with BESS hardware and MiGrid-Operator™ software, cutting runtime by 80% and fuel consumption by 40%. Integrated with PV, our solution achieves up to 90% annual fuel savings, tailored for the agriculture industry with a five-year payback period.

CLIENT CHALLENGE

Conventional gas generators are often kept on standby around the clock, yet they operate below peak efficiency for about 95% of the time. Industries, notably in oil and gas extraction, heavily depend on self-contained power generation and storage.

PROJECT SPECS AND PARAMETERS

Enclosure:
Outdoor Cabinets

TROES Battery Capacity:
368kWh/100kW

Building Type:
Oil and Gas Industries, Industrial Facilities, Agricultural Buildings, Remote Villages, Tele Tower, Military

Key Components:
BESS, PV Fossil Fuel Generator, Control Software

Function:
Diesel Optimization, Renewable Self-Supply

Location:
Ontario, Canada - Industrial Application

TROES uniquely offers an exclusive BESS hardware and Microgrid Control software solution for off-grid diesel optimization application. Our MiGrid-Operator™ software caters to specific client requirements and supports scalability for future needs.

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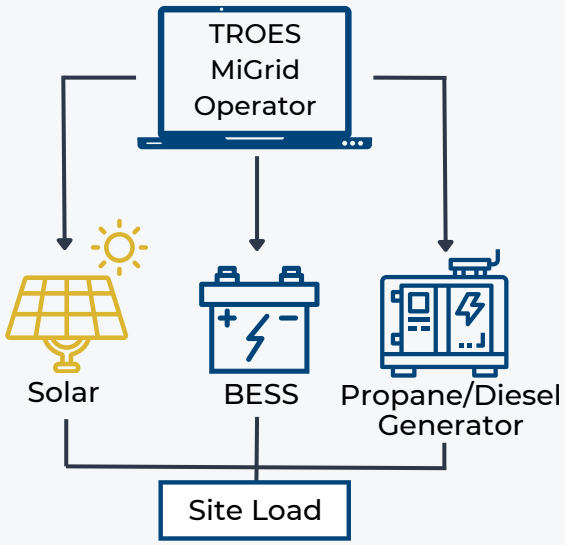
TROES' SOLUTION

By adding Battery Energy Storage System into the system, the generator will only be turned on for less than 1/5 of its original running hours; TROES's solution improves fuel consumption by 40%. The project also includes PV and combined with BESS, this microgrid upgrade saves 90% of fuel annually. This system is expandable in the future if more loads need to be supported.

OPERATION LOGIC



TROES MiGrid Operator **MiGrid Operator:** Real-time visualization of power flower in microgrid, remote control ability.

Solar Panels: Solar energy supports the site load, and excess energy is stored in the BESS.

BESS Interaction: Stores excess energy from solar panels, releases stored energy to support site load during high demand.

Propane/Diesel Generator: Used when energy demand exceeds renewable energy generation and battery capacity.

Site Load **Site Load:** BESS, Solar, and Propane/Diesel generator support the site load.

PROJECT RESULTS

- Off-grid diesel optimization achieved with BESS + Solar PV + MiGrid Operator Software
- **Initial Project Cost:** Confidential
- **Customer Type:** Canada-Based Agriculture Community
- **End User:** Farm
- **Project Timeline:** December 2022
- **Estimated Payback:** ~5 years

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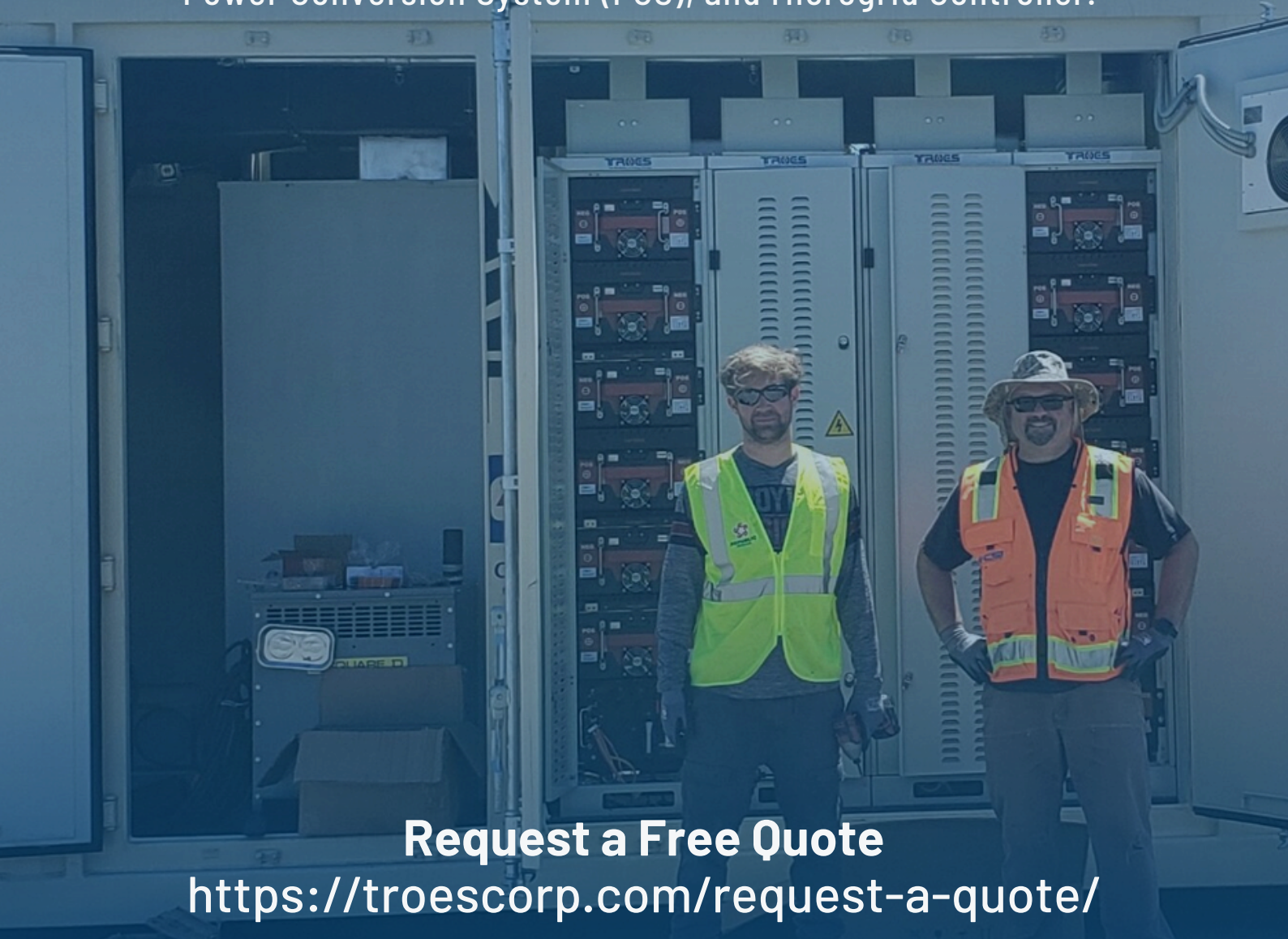
TROES is a Canadian company specializing in advanced distributed energy storage technologies, products, and solutions. TROES develops, designs, manufactures and delivers high-performance cloud-based energy storage systems integrating TROES' proprietary Battery Modules, Battery Management Systems (BMS), Enclosures, Power Conversion System (PCS), and Microgrid Controller.



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