AKA Microgrid

Redefining Energy Independence and Resilience

Ahead of the Current

www.aka-group.com

AKA Energy Systems

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AKA's Smart Microgrid is a distributed energy solution that responds to load and power fluctuations through bridging, peak shaving, shifting, and smoothing functions, ensuring reliability and efficiency. With backup power generation, grid support, and customizable energy storage options, the Smart Microgrid meets diverse installation needs.

AKA's Modular Solutions Are

SAFE
The design provides continual safe operation for the equipment, the maintainer, the connected power sources, and the grid.

SCALABLE
Multiple Smart Microgrid systems can function as a single system on a distributed grid or on a single microgrid using a proprietary technique for sensing the health of the adjacent systems. Single systems are scalable from KW to MW building block elements.

ADAPTABLE
Multiple energy storage options are available to accommodate a variety of renewable energy sources.

MICROGRID FEATURES

Energy Management

AKA's Smart Microgrid transforms energy management with its dynamic approach, considering various factors to optimize resource allocation and usage. It evaluates variables such as:

- Cost of local power generation
- Cost of utility power
- Price to sell power
- Day of the week and holiday operational profiles
- Environment (weather, tides, etc.,)
- Variable energy storage reserve

Leveraging real-time data and predictive analytics, the Smart Microgrid orchestrates energy flows according to demand patterns, enhancing grid performance and seamlessly integrating variable energy sources into the existing infrastructure.

Energy Storage

The Smart Microgrid integrates advanced long-term and short-term energy storage solutions to meet specific energy demands efficiently. Long-term storage ensures continuous power availability during periods of low generation or high demand, while short-term storage enables rapid responses to load fluctuations and variable power generation. This integration enhances grid stability, reliability, and optimizes energy usage, enabling uninterrupted power supply and efficient management, whether storing excess renewable energy or providing backup during grid disruptions.

Renewable Energy and Base Load Production

An AKA Smart Microgrid regulates the power supply and smooths the quantity of electricity sold back to the grid from PV or other variable renewable resources. It can also provide balancing and energy management services for integrated distributed resources as well as slow-to-respond base load power generation.

Versatility in Operations

Commercial and Industrial
An AKA Smart Microgrid provides behind-the-meter demand charge reduction for commercial and industrial energy users.

Residential
An AKA Smart Microgrid provides behind-the-meter residential home power bridging, backup power, and power quality improvements and extends usefulness and return on self-generation and net metering models.

Remote
A remote AKA containerized Smart Microgrid integrates multiple renewable, asynchronous, intermittent, and distributed resources. It supports physically isolated electricity systems by sustaining stability and reliability and can also provide balancing services. The system is available in a containerized format, streamlining delivery to remote locations, easy integration into existing facilities as well facilitating a simple lease/ low capex solution.

AKA's Microgrid uses our state-of-the-art modular power solutions, seamlessly integrating medium and low-voltage electrical, control, and safety components, alongside auxiliary systems.

Containerized solutions are designed to ensure the safety of critical and valuable industrial processes and electrical equipment across different land-based and marine applications.

AKA's Modular Solutions Can Include

- Metal insulated or uninsulated ISO standard dry shipping containers modified for a particular environment or custom E-House
- Low or medium-voltage switchgear
- Low or medium-voltage transformers
- Low voltage motor control centers
- Low voltage power conversion equipment
- Energy storage systems and related support infrastructure
- Cables, cable trays, and accessories
- Raised floor
- Mechanical, electrical, and control systems for the container, including lighting, heating, ventilation, air conditioning, fire protection, alarm system, CCTV system, access control systems, SCADA, etc.

TYPICAL CONTAINER SPEC	STANDARD
Wall Insulation Value	R-13
Wall External Sheet	14 gauge
Wall Internal Sheet	24 gauge
Floor Insulation Value	R24
Floor Internal Sheet	6 mm
Floor External Sheet	28 mm thick with 19 ply treated plywood
Roof Insulation Value	R-13
Roof External Sheet	14 gauge
Roof Internal Sheet	24 gauge
Ventilation	Mechanical
DOORS	
Double steel service door with lock	Standard 14 gauge
Single pedestrian doors with lock	Available
LIGHTING	
Internal Lighting Type	Fluorescent or LED
Internal Lighting Flux	Minimum 500 lux
Exit Lights	Equal To Door Quantity

BENEFITS

Improved Return on Investment

- Reduced CAPEX for renewable energy sources; through multi- function equipment utilization
- Peak shaving of local loads to reduce costs during periods when energy rates are high or to reduce demand metering costs
- An alternate revenue stream through the utilization of distributed power generation, on-call peak shaving, kVAR production to the grid

Enhanced Performance

- Lithium polymer battery for compact design and long life span
- Ultra-capacitors for quick response to load changes
- A parallel, non-spinning reserve backup power source with a bumpless transition to island mode of operation utilizing AKA's solid-state generator application
- Autonomous peak shaving in response to a loss of generation capacity or a rapid and unpredicted rise or fall in kW or kVAR loads
- Bridging of peak loading while alternative power sources are started
- Compensation for variability issues associated with renewable energy sources

Increased Reliability

- Temporarily bridging local peak demands that are in excess of the grid connection capacity
- Facilitating utility access to energy storage to ride through peaks that exceed the rotating reserve of the connected generating capacity - can act as part of a distributed peaker plant
- Seamless ride through of the local network in the event of a total loss of the grid or of local generating resource, preventing risk and losses due to interruption in the process
- Unique solution based on years of development in the most demanding marine and oil & gas critical power systems

SAMPLE REFERENCE PROJECT

Canadian Forces Base

The Project

Client
Island Water Technologies

Location
Gagetown, New Brunswick, Canada

Product
Waste Water Treatment Plant Microgrid

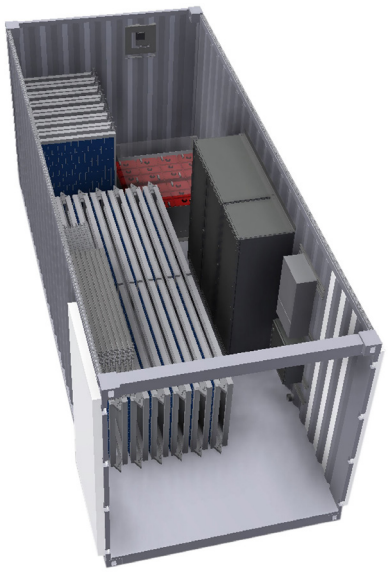
Completion Date
2016

Energy Storage Technology

Lead Acid
Capacity: 8.8 kW
Energy: 55 kWh

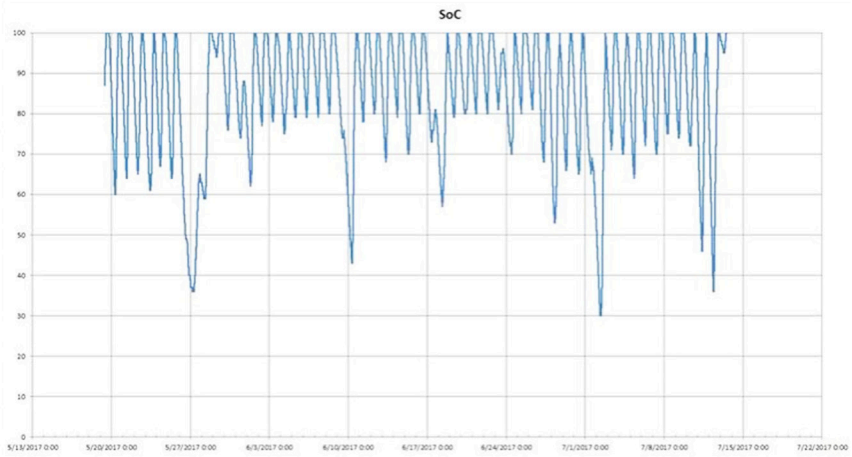
Benefits

- Self Powered
- BRS
- Ease of Transplant & Installation
- Dashboard for Remote Visualization of performance



Power skid packed and ready for deployment

The system was designed with reduced process complexity to provide additional functionality, enabling a reduction in overall tankage. Each step was re-evaluated which achieved more removal/treatment per tank, resulting in a streamlined single-pass wastewater treatment design. Complexity (i.e. moving parts) was removed where possible to keep operator maintenance and energy costs to a minimum. Since installation, the back-up conventional power system has supported the operations of the mobile wastewater treatment system successfully with 100% required power being generated from the photovoltaic array with backup power supplying stand-by functionality only.



SAMPLE REFERENCE PROJECT

AKA Facility Microgrid

The Project

Client
AKA

Location
Pooles Corner, PE, Canada

Product
Commercial/Industrial Microgrid

Completion Date
2018

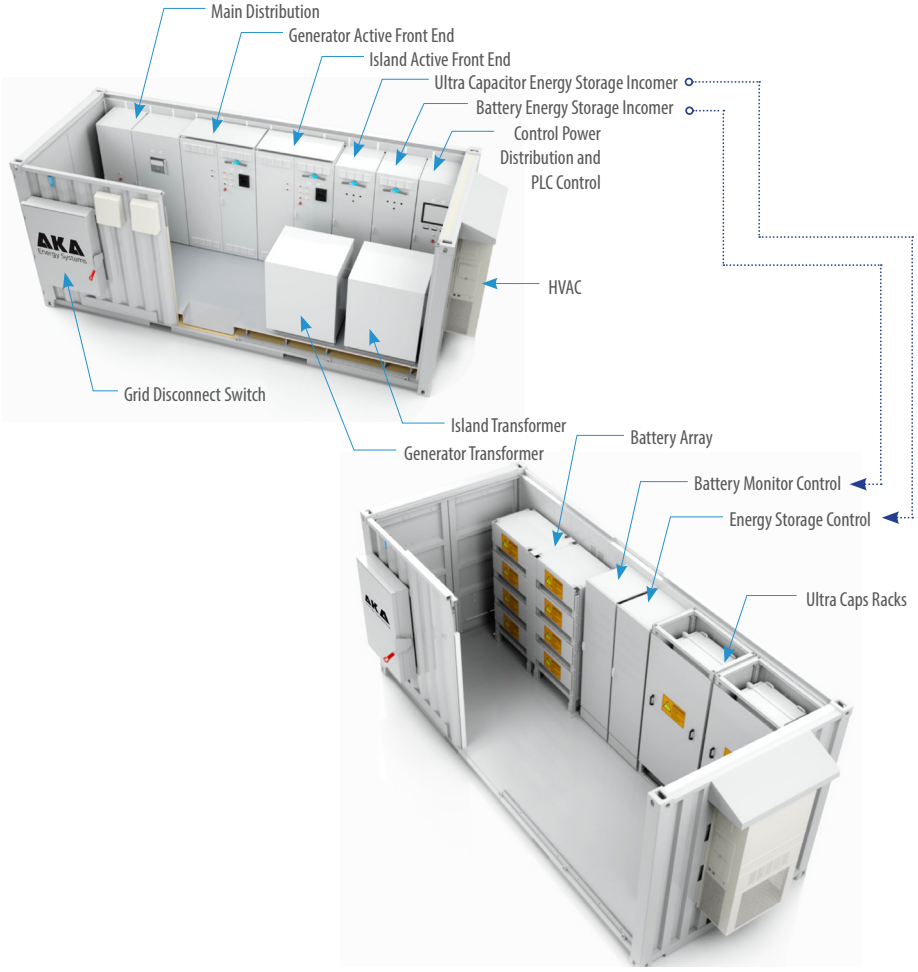
Energy Storage Technology

Ultra-Capacitors and Lithium Ion
Capacity: 200 kW
Energy: - 78 kWh Lithium Ion Battery
- 5.25 MJ Ultra-Capacitors

Benefits

- Seamless integration of renewables
- Anti-Islanding
- Peak Shaving/demand metering reduction
- Generator Availability
  Utility KVAR Compensation
- Synchronization - Bumpless connection/Disconnection
- Bumpless Grid Fault Ride Through
- Data Capture and Analytics
- Predictive Data Driven Optimization

AKA's Pooles Corner Microgrid is designed focusing on power system reliability, power distribution management, and energy storage to support the campus including two facilities; manufacturing and AKA's START CENTRE: engineering building. It incorporates a diesel generator, renewable energy, and energy storage



SAMPLE REFERENCE PROJECT

Summerside Microgrid

The Project

Product
Atlantic Canada's largest solar power plant - AKA installed 46,000 solar panels, the Smart Microgrid and a Battery Energy Storage System.

Completion Date
2023

Energy Storage Technology

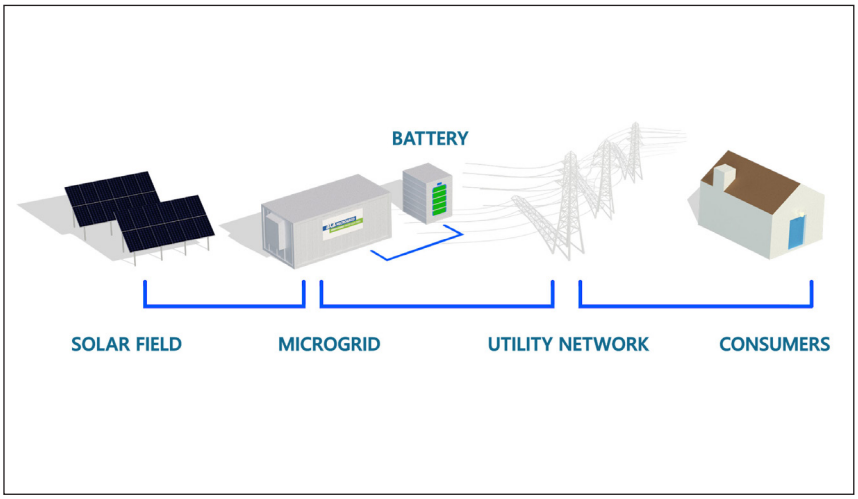
The Summerside Sunbank project utilizes the Smart Microgrid, an advanced energy storage and distribution solution optimizing solar energy usage by dynamically managing energy flow. Additionally, it features the Battery Energy Storage System, with a capacity of 10 MW/30 MWh, efficiently storing surplus energy for future use and enhancing the resilience of the energy infrastructure.

Benefits

This initiative aims to fulfill 25% of the city's electricity needs and cut carbon dioxide emissions by approximately 21,000 tonnes annually.

Other Features Include

- Decreasing Summerside's dependency on imported electricity from 58% to 38%.
- Assisting Summerside in meeting 62% of its electricity needs through renewable energy
- Safeguarding Summerside Electric from volatile energy prices
- Integrating 30,000 MWh of solar energy
- Forming Team PEI, a group of local companies to assist with project
- Assisting with the Province of PEI's GHG emission reduction targets



The City of Summerside along with AKA Energy Systems have developed the largest solar power plant in PEI, Canada. Spanning 80 acres in the heart of Summerside, AKA is installed solar photovoltaic panels, a Smart Microgrid, and a Battery Energy Storage System.

The Summerside Sunbank Project is set to cover 25% of the city's electricity needs and reduce carbon dioxide emissions by 21,000 tons annually. This initiative not only reduces the city's reliance on imported electricity but also fuels economic growth and promotes renewable energy adoption. By repurposing existing land for clean energy generation, it stabilizes energy prices and integrates solar power into the grid, allowing Summerside to meet 62% of its electricity requirements with renewable sources, including solar and wind energy.

In collaboration with the City of Summerside, AKA Energy Systems completed the construction of one of Atlantic Canada's largest solar power plants in 2023.

Learn more about
Summerside Sunbank

AKA Energy Systems

AKA Energy Systems (Aspin Kemp & Associates Inc.) is an energy systems provider delivering innovative solutions to island and microgrid power systems. AKA designs, manufactures, and supports power and propulsion assets for marine, Offshore O&G, and land-based industries. AKA has shifted the paradigm for fuel efficiency and reliability in offshore drilling with proven fuel savings of over 50% and similar results in marine and land-based microgrids.

AKA offers a full spectrum of integrated products and services including systems integration, new product development, engineering, manufacturing, testing, installation, commissioning, life cycle support, field services, integrated documentation, and training. AKA's manufacturing facility in Prince Edward Island, Canada includes a state-of-the-art mechanical fabrication shop, an electrical assembly area, and a medium voltage test bay. AKA's global clients and partners also include MAN Energy Solutions, Transocean, Shell, GE Energy, Siemens, Eaton, Schneider Electric, and many more.

AKA
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