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# applications

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Salgenx

Salt Water Flow Battery Applications



This webpage QR code

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Salt Water Flow Battery Applications.

PDF Version of the webpage (first pages)

## Salgenx Salt Water Flow Battery

The salt water flow battery is designed for large commercial and utility projects. The low cost makes it affordable for many smaller business applications including charge stations, remote power, and grid energy arbitrage.

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## **Demand Support or Grid Arbitrage**

Charge during off-peak periods and use during on-peak demand to support distribution infrastructure. This includes the optional thermal storage capacity which allows you to use high COP (coefficient of performance) heat pumps to make hot or cold water.

## Microgrid

For remote or localized grid which allows power supply without the grid.

## Wind and Solar Renewable Smoothing

Wind turbines and solar PV need flow balancing to the grid by storing production and discharging energy when needed.

## Market Penetration

Response to system operator alerts by providing energy support in grid systems.

## Infrastructure Investment

Storing power in a single location is more affordable than expensive grid infrastructure upgrades. May also use for high energy demand peaks.

## **Voltage and Frequency Regulation**

Absorb reactive power and adjust output resulting in stabilizing voltage levels.



## Cogeneration

Use waste heat to thermally store in saltwater for use at a later time. This use of simultaneous power and thermal allow for cogeneration of energy which substantially reduces investment payback.

## Desalination

A breakthrough in desalination technology has been announced today with the unveiling of a new system that uses a saltwater flow battery cycle to produce clean drinking water from seawater. This innovative solution has been developed by a team of scientists and engineers who have been working tirelessly to create a sustainable and cost-effective way of storing energy while simultaneously producing fresh water.

The desalination system operates by using a saltwater flow battery cycle, which involves the movement of ions between two electrodes to store or discharge electricity without a membrane (which is typical with Vanadium or Bromine flow batteries). In this case, the process is used to remove salt from brine or seawater. The system can use a renewable energy source, such as solar power or large wind turbine, to charge the battery, making it both environmentally friendly and cost-effective.

## **Producer Water Conditioning for Oil and Gas Industry**

The technology of the salt water flow battery will allow oil and gas wells to use their well as a battery, while simultaneously perform water conditioning. Imagine pumping oil and gas, while simultaneously storing power in the same well to power pumps. The concept of stranded oil and gas will now morph into any well becoming a battery or recharging station. Adding a Organic Rankine Cycle generator to utilizing well geothermal heat to make power allows complete separation from the grid, or IC engine generators, which need constant maintenance.

## Charge Stations for EV Cars Vans and Tesla Semi

Charge stations are starting to integrate battery packs for their charging stations.

## Applications of Flow Batteries based on Open A I

**Grid-scale energy storage:** Flow batteries can be used to provide grid-scale energy storage in Ukraine, helping to balance the grid and improve the reliability of the power supply.

**Renewable energy integration:** Flow batteries can be used to store energy generated by renewable sources such as wind and solar, helping to increase the penetration of renewables in the country.

**Microgrids:** Flow batteries can be used to provide power for microgrids, particularly in remote and rural areas, where access to the grid is limited.

**Backup power:** Flow batteries can be used as backup power for critical infrastructure, such as hospitals and emergency services, in case of power outages.

**Electric vehicles:** Flow batteries can be used to power electric vehicles, helping to reduce dependence on fossil fuels and improve air quality.

**Industrial applications:** Flow batteries can be used to provide power for industrial applications, such as manufacturing and mining, where a reliable and long-duration energy source is needed.

**Agriculture and irrigation:** Flow batteries can be used to provide power for irrigation systems, helping to improve crop yields and reduce dependence on fossil fuels.

**Telecommunications:** Flow batteries can be used to power telecommunications systems, such as base stations and cell towers, providing a reliable and long-duration energy source in remote locations.

It's worth noting that some of these applications may still be in the early stages of development and implementation.

**Grid-scale energy storage:** Flow batteries can be used for grid-scale energy storage, particularly for storing excess energy generated from renewable sources such as wind and solar. This can help to balance the grid and provide a reliable source of energy during periods of low renewable energy generation.

**Transportation:** Flow batteries can be used to power electric vehicles, such as buses, trucks, and trains, helping to reduce dependence on fossil fuels and improve air quality in urban areas.

**Energy management:** Flow batteries can be used to store energy during off-peak hours, and to release it during peak hours, reducing the burden on the grid and helping to improve energy efficiency.

**Military applications:** Flow batteries can be used for military applications, such as powering communication systems, unmanned systems, vehicles and backup power for critical systems.

**Remote Sensing:** Flow batteries can be used to power remote sensing equipment, such as cameras and radar systems, providing a reliable and long-duration energy source for use in remote locations.

## Military Applications of Flow Batteries based on Open A I

There are several potential military applications for flow batteries, including:

**Portable power:** Flow batteries can be used to provide portable power for military equipment, such as communication systems, navigation systems, and sensor systems, in remote locations where access to traditional power sources is limited.

**Unmanned systems:** Flow batteries can be used to power unmanned systems such as drones and robots, providing them with a long-duration energy source for extended missions.

**Base power:** Flow batteries can be used to provide power for military bases, particularly in remote locations or in situations where the grid is unreliable.

**Backup power:** Flow batteries can provide backup power for critical systems, such as command and control systems, in case of power outages or other disruptions.

**Field hospitals and medical equipment:** Flow batteries can be used to power medical equipment in field hospitals, providing a reliable and long-duration energy source for critical care.

**Mobile power:** Flow batteries can be used to power mobile systems such as vehicles, providing a durable and high-performance energy source for use in harsh environments.

**Electric vehicles:** Flow batteries can be used to power electric vehicles, such as ground vehicles, watercraft, and aircraft, providing a reliable and long-duration energy source for use in the field.

**Remote sensing:** Flow batteries can be used to power remote sensing equipment, such as cameras and radar systems, providing a reliable and long-duration energy source for use in remote locations.

**Communication systems:** Flow batteries can be used to power communication systems, such as radios and satellite systems, providing a reliable and long-duration energy source for use in remote locations or situations where grid power is not available.

It is worth noting that flow batteries are still in the early stages of development and most of their military applications are still in the research and development phase.

## What are 20 ways to make money with flow batteries ?

Energy arbitrage: Storing energy when it is inexpensive and then discharging it when energy prices are high can help to reduce the cost of energy for businesses and consumers.

Frequency regulation: Providing frequency regulation services to the grid can generate revenue from grid operators.

Ancillary services: Providing a variety of ancillary services such as spinning reserve, voltage support, and black start capabilities can generate revenue from grid operators.

Peak shaving: Reducing peak demand charges by storing energy during periods of low demand and then discharging it during periods of high demand can help to reduce the cost of energy for businesses and consumers.

Renewable energy integration: Storing energy generated from renewable sources such as wind and solar can increase the penetration of renewable energy and reduce the use of fossil fuels.

Microgrids: Grid-scale batteries can be used in microgrids to reduce the cost of energy for businesses and communities.

Transmission and distribution deferral: Grid-scale batteries can be used to defer the need for transmission and distribution upgrades and reducing the cost of grid infrastructure.

Wholesale market arbitrage: Participating in the wholesale energy market and buying energy when it is cheap and selling it when it is expensive can generate revenue.

Capacity market: Participating in capacity market and providing capacity services can generate revenue.

Back-up power: Providing backup power to critical infrastructure during power outages can generate revenue.

Demand response: Participating in demand response programs and reducing energy consumption during peak demand periods can generate revenue.

Grid stabilization: Helping to stabilize the grid during periods of high demand or supply fluctuations can generate revenue.

Electric vehicle charging: Providing electric vehicle charging services can generate revenue.

Distributed energy resources management: Managing distributed energy resources such as solar panels and wind turbines can generate revenue.

Energy storage certificates: Selling energy storage certificates to utilities or other entities can generate revenue.

Remote area power supply : Providing power to remote areas that are not connected to the main grid can generate revenue.

Island power systems: Providing power to islands can generate revenue.

Telecommunications power backup: Providing backup power to telecommunications systems can generate revenue.

Water treatment: Using grid-scale batteries in water treatment plants can reduce energy costs and generate revenue.

Mining: Using grid-scale batteries in mining operations can reduce energy costs and generate revenue.

It's important to note that these are potential ways that grid-scale batteries can save or make money, and the specific opportunities will vary depending on the location, regulations, and the specific battery technology. It is also important to consider the cost of the battery and the life cycle cost of the battery before making a decision.

## What is the market size for flow batteries ?

The potential market size for flow battery technology is difficult to estimate as it depends on a number of factors, such as the rate of technological advancement, the cost of the technology, and the adoption rate of renewable energy sources. However, it is expected to grow significantly in the coming years.

The global flow battery market size was valued at \$80 million in 2018 and is projected to reach \$ 1.1 billion by 2026, growing at a CAGR of 38.6% from 2019 to 2026.

The growth in the flow battery market can be attributed to increasing demand for energy storage systems, particularly for integration with renewable energy sources, and growing adoption of electric vehicles.

Additionally, as grid-scale energy storage becomes increasingly important for balancing renewable energy sources, the market for flow batteries is expected to grow rapidly. Flow batteries have the advantage of long-duration energy storage, which makes them well-suited for this application.

Also, the increasing investment in research and development for energy storage technologies, increasing demand for energy storage systems in the electric vehicle industry, and growing awareness about the benefits of energy storage systems are driving the growth of the flow battery market.

However, the high cost of flow batteries compared to other energy storage technologies, such as lithium-ion batteries, and lack of standardization are expected to hinder the growth of the market.

In summary, the flow battery technology market has a huge potential, however, it will depend on the rate of technological advancement, the cost of the technology, and the adoption rate of renewable energy sources.



## What are the top 20 applications for flow batteries ?

Energy arbitrage: Storing energy when it is inexpensive and then discharging it when energy prices are high can help to reduce the cost of energy for businesses and consumers.

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