UPGRADE THE WAY YOU COOL.

Traditional Liquid Cooling vs ROCAS Dielectric Immersion

Thermal performance | Operational reliability | Fire safety

ROCAS ENERGY

POWERING A SUSTAINABLE FUTURE

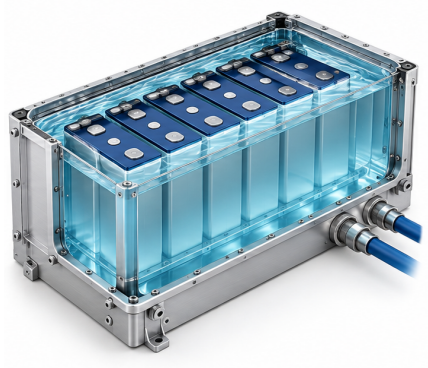
Direct cooling. Stronger thermal control. Better lifecycle potential. Bring heat management to the cell surface and make protection part of your investment decision.

TECHNICAL DECISION	TRADITIONAL LIQUID / COLD PLATE	ROCAS DIELECTRIC IMMERSION
Heat transfer	Indirect: cell > interface > plate > coolant.	Direct: cell surface > dielectric fluid.
Temperature uniformity	Plate contact and flow distribution shape the result.	Broad fluid contact supports more uniform temperatures.
Hot spots / thermal stress	Heat must travel to the cooled contact area.	Direct heat pickup helps control local hot spots.
Electrical insulation	Coolant is contained in a sealed plate circuit.	Electrically insulating fluid surrounds the cells.
Fire-protection contribution	Plate heat removal plus BMS and system protection.	Direct heat absorption can help limit thermal propagation.
Intensive operation	Established option for compact, high-load BESS.	A compelling option for intensive cycling and cell-level cooling.
Service & design needs	Circuit integrity, coolant, pumps, seals and plate contact.	Compatible dielectric fluid, seals, circulation and gas management.

TRADITIONAL LIQUID / COLD PLATE

+ Established liquid circuit. - Indirect thermal contact.

ROCAS DIELECTRIC IMMERSION



+ Direct cell contact. - Fluid compatibility and monitoring.

AI-generated concept renderings. Cooling complements BMS, detection and system-level fire protection; final performance is product-specific.

MAKE EVERY CYCLE COUNT.

A higher initial investment can deliver a lower capital cost per cycle.

Thermal performance | Operational reliability | Fire safety

ROCAS ENERGY

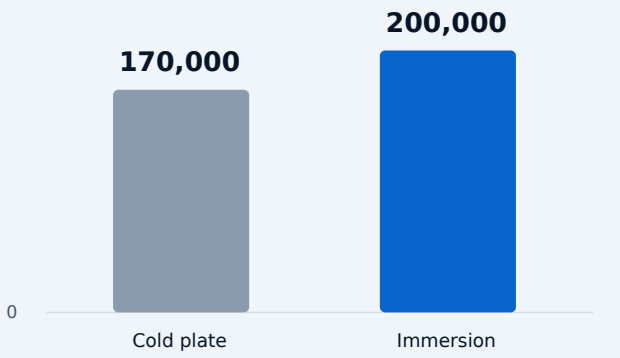
POWERING A SUSTAINABLE FUTURE

In the illustrative 0.5C scenario: +17.6% CAPEX buys +71.4% more equivalent full cycles and 31.4% lower capital allocation per cycle.

Traditional liquid cooling ROCAS immersion scenario

INITIAL CAPEX

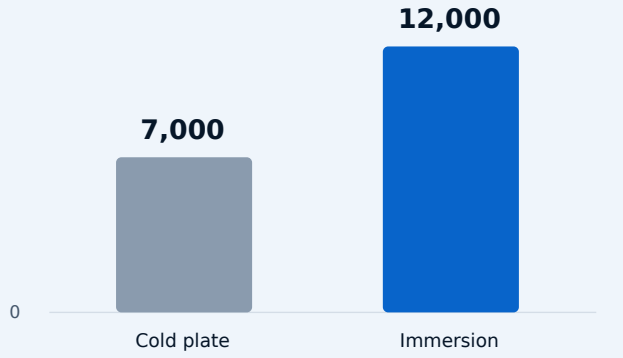
EUR / MWh



+17.6%

CYCLE-LIFE ASSUMPTION

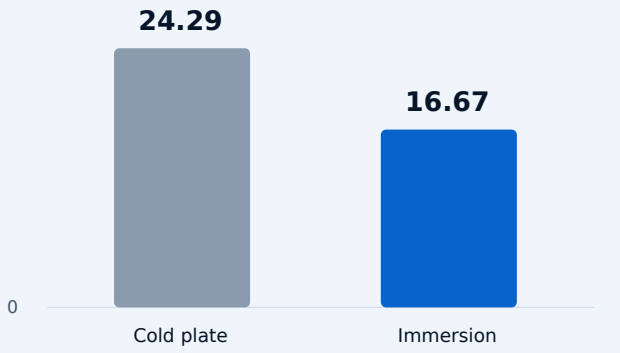
Equivalent full cycles



+71.4%

CAPITAL PER CYCLE

EUR / initial MWh / EFC



-31.4%

THE NUMBERS BEHIND THE VALUE

Cold plate: EUR 170,000 / 7,000 EFC = EUR 24.29 per initial MWh per cycle.
Immersion: EUR 200,000 / 12,000 EFC = EUR 16.67 per initial MWh per cycle.

EUR 7.62 less
capital allocation per initial MWh per EFC.
A lifecycle comparison that goes beyond purchase price.

Illustrative inputs, equal scope and comparable EFC qualification assumed. Actual cycle life depends on calendar ageing, duty cycle and end-of-life criteria. This simple CAPEX / EFC metric excludes energy, losses, OPEX, augmentation and discounting; it is not complete LCOS.

REQUEST YOUR ROCAS LIFECYCLE COMPARISON.

A proposal matched to your power, capacity and operating strategy.

info@e-rocas.com | +40 775 368 311

FIRE RISK IS AN INVESTMENT RISK.

Real incidents. Real exposure. Safety belongs in the buying decision.

Thermal performance | Operational reliability | Fire safety

ROCAS ENERGY

POWERING A SUSTAINABLE FUTURE

A battery fire can damage assets, stop dispatch and disrupt the site. Ignoring that exposure puts capital and future revenues at risk. Evaluate protection before you buy.

STALPU, ROMANIA

26-27 August 2026

Fire in a battery-storage hall. IGSU described a difficult, prolonged intervention. The release does not establish the cause.

DSU capture / supplied deck; IGSU report

CZAJKOW, POLAND

7 May 2026

Container battery fire. Rising temperatures prompted continued cooling, thermal monitoring and evacuation of nearby people.

Photo and report: PSP Poznan

VICTORIA BIG BATTERY

30 July 2021

Fire spread to a neighbouring Megapack during commissioning. Investigators identified a probable coolant leak and electrical faults.

Photo: FRV / ABC; report: FEI / ESRG

PROTECT THE ASSET. PRESERVE THE REVENUE.

CELL-LEVEL THERMAL CONTROL

Direct contact helps remove heat and manage hot spots.

LAYERED SAFETY

Combine dielectric immersion with BMS, detection, gas and fire protection.

SYSTEM-LEVEL VALIDATION

Select tested configurations and a defined maintenance plan.

The incidents illustrate BESS fire exposure, not a controlled comparison of cooling methods. Stalpu and Czajkow cooling configurations are not established here. Immersion can help limit propagation; it does not create a zero-fire guarantee. Photos and credits reproduced from the supplied ROCAS safety deck.

Thermal principles Fluid technology ESS test example Storage economics