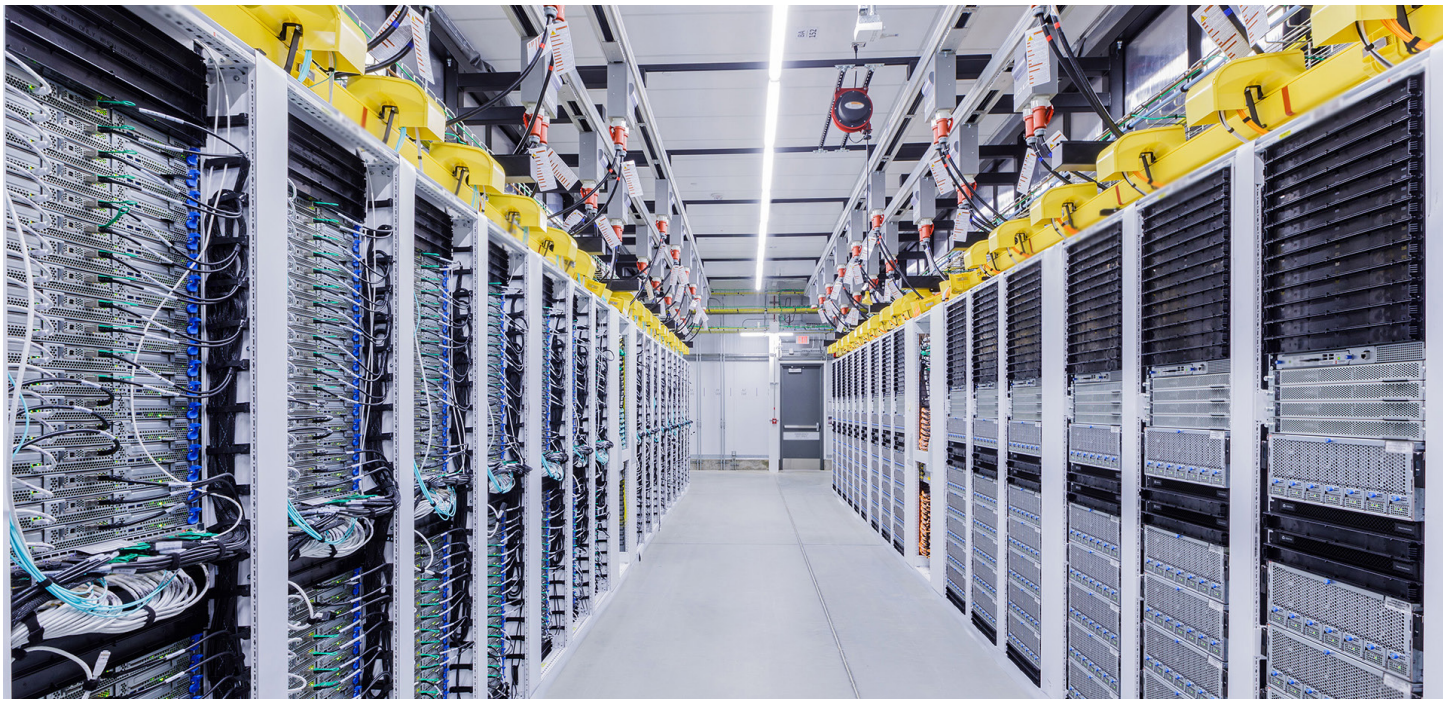
TYPE OF WORK: GEOSTORAGE

PAST PROJECT

Microgrid Data Centre

MAJOR CREDIT CARD COMPANY, USA



PROJECT INSIGHT: When designing microgrids for mission-critical infrastructure, stakeholder alignment on operational risk tolerance is as important as technical feasibility. Early-stage engagement with facilities and IT operations teams ensured that system resilience and uptime were not compromised by aggressive decarbonization targets, shaping a solution that balanced innovation with institutional confidence.

Year built	**2024**
Client	**Major credit card company**
Building size	**4.5 MW Data centre load**
Contract size	**$70,000 USD**
System size	**3.67 GWH thermal storage capacity**

Our team (with previous firm) supported a credit card company in advancing its sustainability objectives at its classified data center and office campus through a comprehensive microgrid feasibility study. The study aimed to significantly reduce reliance on grid electricity – especially during peak hours. We evaluated the building's energy conservation measures alongside renewable energy (solar and wind) and storage integration opportunities (long and short duration).

Peak load shifting – the key project mission was accomplished by thermal energy storage. Above-ground chilled water, phase change material, and ice storage were found to be less effective or cost-prohibitive compared to Geostorage (BTES). The cold Geostorage system emerged as the cornerstone of the energy strategy – **designed to reduce the campus's cooling energy demand by 68% and enable seasonal shifting of renewable energy, with a storage capacity of 3.67 GWh.** This approach significantly reduces curtailment and operational costs while improving overall energy resilience. We leveraged underutilized parking lot space for solar generation integrating both standard PV modules and PVT collectors to simultaneously generate electricity and reject heat to a seasonal cold Geostorage system. Existing cooling towers were leveraged in heat rejection for the Geostorage system with the existing chillers waste heat made a significant contribution to the buildings heating demand.

This holistic, future-ready energy strategy offers a scalable roadmap for deep decarbonization, serving as a potential model for the credit card company's global data center operations.