Redox Flow Storage Market

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Global Leader in Vanadium-Redox-Flow Batteries Long Duration Energy Storage

Ceicube BUILDING ENERGY STORAGE INFRASTRUCTURE

FB 500-2000

Business at a glance



Double digit million revenues



CellCube is fast growing scale-up company



140+/14MW/75.3 MWh

#Systems deployed/contracted globally

20+ years



Research and development



Serial product / being rolled-out

TRL 9 for industrial grade megawatt roll-outs



Patents





90+ in 3 countries

Employees with significant experience



CellCube's proven track record of globally deployed systems makes us #1 choice for industrial grade VRFB technology



CellCube's VRFB technology is proven and bankable for a 25+ years of operation without degradation



Electric power equipment – Resilient Microgrid in Illinois, US

GRW Electric Industrial Microgrid Market sector Location Bolingbrook, USA **CellCube Product** 4 x FB 500-2000 Energy shifting, peak shaving, UPS, PJM **Key Applications** Rated power / capacity 2MW / 8MWh



Medical Equipment - Resilient Microgrid in California, US



Applied Industrial Microgrid Santa Margarita, California, US 1 x FB500 - 2000, 1x FB250 - 1000 Energy shifting, offgrid, backup 0.75MW / 3MWh







Critical Infrastructure Ipiranga, Brazil 1 x CellCube FB 250-1000 Peak Mgmt, Frequency / Voltage Regulation 250kW / 1000 kWh

Automation & Drives Facility – EV-Charging, Switzerland

DMG MORI

Commerial Microgrid Winterthur, Switzerland 1 x CellCube FB 200-400 Green e-mobility charging station 200 kW / 400 kWh



Mining Plant - moving towards net-zero, South Africa

Market sector Location **CellCube Product Key Applications** Rated power / capacity

Remote Microgrid Brits, South Africa 2 x CellCube FB 500-2000 Energy shifting, renewable integration 1MW/4MWh

Lighthouse Project, Australia

Market sector Location **CellCube Product Key Applications** Rated power / capacity



BUSHVELD

Industrial Microgrid Sydney Area, Australia 12 x CellCube FB333 - 2666 Energy shifting, FFR, arbitrage 4 MW / 16MWh



Market sector Location **CellCube Product Key Applications** Rated power / capacity

Critical Infrastructure Lichtenegg, Austria 1 x CellCube FB 10-100 renewable integration, DSM 10 kW / 100kWh

Grid Company - Resilience for energy community, Sweden

Grid Company – Renewable Integration, Austria

>10 years in continuous operation (COD in 2010)



Critical Infrastructure Simris, Sweden 1 x CellCube FB 250-1000 Renewable baseload, Islanding 0,25MW / 1MWh



EVN





Market sector Location CellCube Product **Key Applications** Rated power / capacity

Reference Project: Microgrid Campus

Provider of electric power equipment / Bolingbrook, IL



Location	Boilingbrook, USA
Rated power AC/DC	3MW/2MW
Rated capacity	8MWh
Product	4x CellCube FB 500-2000
Installation/COD	Q4 2022 / Q1 2023
Application	Solar integration, Energy shifting, peak shaving, blackstart, UPS & frequency services PJM





"Cellcube was chosen based on having the lowest Total Lifecycle Cost (Price, Distribution, Maintenance, Freight and Disposal) as well as meeting our Reliability, Quality, R&D, Environmental Safety, and potential partnership criteria."

CellCube is the benchmark in VRFB long duration energy storage technology



MADE BY GLOBAL MARKET LEADER

50%+ market share with 140+ projects globally deployed

EASYTO SCALE

adding power and energy modules when needed



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200% POWER

OVERRATING

without negative effects

on cycles or lifetime

HIGH PERFORMANCE

Industrial grade heavy duty use, Long-lasting (25+ years and 20,000+ cycles), multi-cycling per day, 100% usable depth of discharge, temperature conditions flexible





SUBSECOND RESPONSE TIME & up to 24 hrs DISCHARGE TIME

Future proof - widest range of applications Supply to meet demand from <100 ms response time and up to 24 hrs discharge time



ISLANDABLE

Microgrid ready to connect

Munich RE 🗐	
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BANKABLE

A+ rated warranty insurance decades of validation



SAFE

Non-flammable, non-explosible, no leakage, build-in-safety



RELIABLE

12+ years in continuous operation

SUSTAINABLE & REUSABLE

No degradation, 25+ year lifetime, re-usable, local assembly, repair friendly, no rare earths, contribution to a Circular Economy

CellCube VRFB's are the most versatile and industrial grade batteries to cope with todays and future requirements

VRFB applications & Use Cases



Long-duration Energy Storage LDES Market



Renewables will constitute 70% of the global power mix by 2050, driving the requirement for energy storage



(1) Includes hydro, wind, solar, biomass, geothermal & solar thermal; (2) Includes gas, nuclear, coal & oil; (3) Includes pumped hydro & peaker gas

Long Duration Energy Storage (LDES) will be required to get to net-zero power systems

Adoption curve of longer flexibility durations accelerates at 60-70% RE penetration



RES integration leads to new system challenges



Power supply and demand not always in balance



Transmission flow changes potentially require costly and lengthy transmission upgrades



Retirement of conventional, synchronous generators creates need for new sources of grid support services, e.g., reactive power, inertia

The energy ecosystem is decentralising, decarbonising and digitalising

Driven by renewables expansion, energy storage is the key enabler of the energy transition



Energy transition increasingly about more than decarbonization – energy security and affordability are key imperatives

Deep and early decarbonization of power sector is key to achieving 1.5 C targets

Global historical emissions of the power sector and assumed reduction pathways

Gt CO₂e



Energy transition also seen as means to reduce dependence on imports

European Union imports from Russia, %, 2021

Historical emissions — — Net-zero 2035 (MEDCs reference case)¹ — — Net-zero 2040 (Global reference case)²



1. Informed by IEA Net Zero 2050 report on more economically developed countries (MEDCs) needs to get to net zero power by 2035. Consistent with US President Biden climate ambition.

2. Informed by IEA Net Zero 2050 report on the world's power sector needs to get to net zero by 2040.

Source: Net-zero power: Long duration energy storage for a renewable grid (November 2021), IEA, European Commission



Source: March 2023 Beatriz Sinobas, DG ENER Unit B4

Source: JRC analysis.