



White Paper

ArcActive and the Missing Middle in Energy Storage

How consequences shape
commercial battery deployment



October 2026

Long Life, Low Cost Energy Storage

Executive Summary

ArcActive is a New Zealand battery technology company developing long-life, low-cost lead-acid storage for commercial and industrial (C&I) customers. A large market for these batteries should exist. Businesses want to reduce electricity costs, and battery prices have fallen. Yet while utility-scale and residential storage have become substantial markets, C&I deployment remains modest compared with what the industry expected. We call this the Missing Middle.

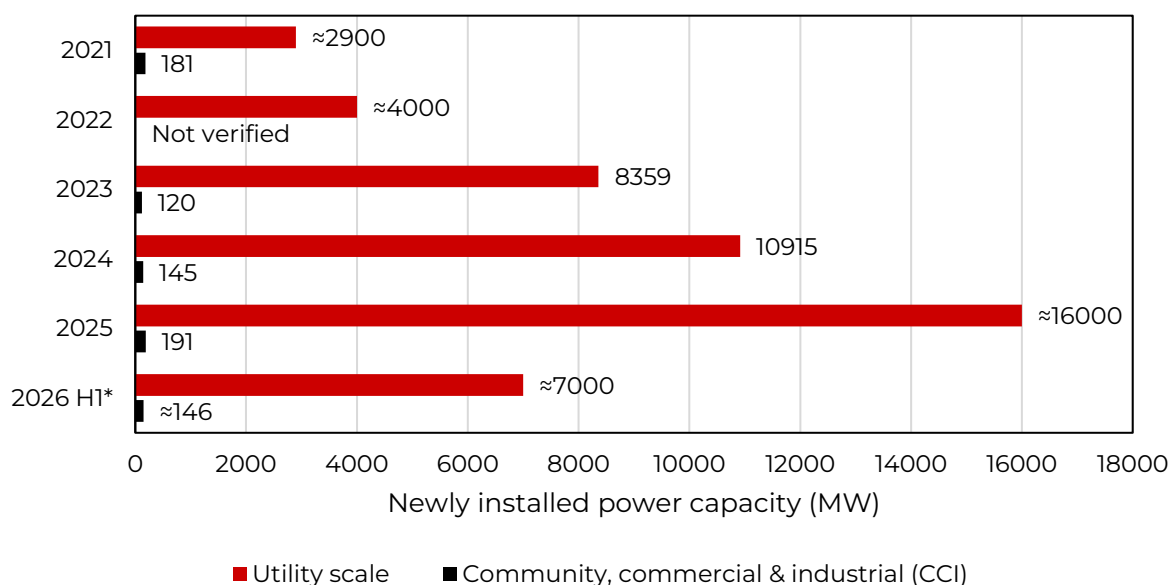
ArcActive believe a major reason is what happens when a large battery is placed close to people and property. A project can look attractive at the outset, then become much harder to justify once the consequences of a potential incident are worked through. Requirements for approvals, insurance and internal acceptance can turn a straightforward investment into a complex and costly project. The experiences below show how opportunities that initially look economic can fail to become operating assets.

The expected market and the deployment gap

In August 2023, McKinsey forecast global C&I battery additions of 52–70 GWh a year by 2030, with compound annual growth of 13%. Its definition covered EV charging, critical infrastructure, commercial buildings and factories, and harsh-environment applications. That gives a sense of the scale of the market the industry expects to develop. [1]

US deployment data show the difference in scale. Between 2021 and 2025, annual utility-scale additions increased by 550% to 16 TWh; while additions in the community, commercial and industrial (CCI) category remained below 200 MW in each full year over the same period. CCI is a broader category than C&I alone. These figures describe the deployment gap; they do not establish its causes. [2]

The US Energy Storage Deployment Gap



*2026 H1 covers January to June only and is not annualised.

CCI includes community storage as well as commercial and industrial sites. Missing 2022 CCI data is not zero, reporting vintages differ, ≈ indicates approximate values. [2]

Period	Utility scale additions (MW)	CCI additions (MW)
2021	~2900	181
2022	~4000	Not verified
2023	8359	120
2024	10,915	145
2025	~16,000	191
2026 (First Half)	~7,000	~146

2026 covers January to June only and is not annualised, CCI includes community storage as well as commercial and industrial sites. Missing 2022 CCI data is not zero, reporting vintages differ, ≈ indicates approximate values. [2]

Consequences change the investment decision

A business installing a battery has to consider more than the possible loss of the battery itself. An incident could affect neighbouring property, public safety, business operations and incur liability to third parties. What emergency services can realistically do at the site also matters. In correspondence with us, an author of the Australian Renewable Energy Agency (ARENA) community-battery pre-deployment report, described how proponents became more aware of these consequences as they examined credible scenarios for an incident escalating. They had not necessarily concluded that an incident was more likely. They had developed a fuller understanding of what it could affect.

Each organisation involved looks at a different part of that exposure. Fire authorities consider emergency response and protection of adjacent assets. Insurers assess potential losses and coverage, while planners consider surrounding land uses. The customer's risk committee has to decide whether the expected savings justify the risk that remains. Meeting all of these requirements can mean bespoke engineering, protective works, liability negotiations and redesign. The project becomes more complex, Total Deployed Cost (TDC) rises, and the schedule extends. In many cases, the project stops.

Cheaper equipment and investment incentives improve the initial business case but do not resolve concerns about the consequences of an incident occurring on a constrained site. We believe an important part of the Missing Middle comes down to this: projects that appear economic at the start lose their advantage as the requirements for an acceptable installation become clear.

What the market experience tells us

ARENA's published report records significant design rework to meet requirements for separation distances, fire-rated enclosures and suppression. Projects near public areas or dwellings had to revise layouts or container types. Additional fire-engineering reports and modelling added cost and delay. Insurance was often unavailable or unaffordable until detailed mitigation plans had been approved. While these projects were community batteries, the same issues are relevant to C&I sites with similar exposure to people and property. [3]

One large retail property operator provides a useful example. It had an extensive behind-the-meter solar portfolio and wanted batteries to improve the value of that generation across its sites. In discussions recorded by ArcActive, its energy team described the need for substantial additional civil works at one of two installations, covering fire-rated construction, blast protection and firewater containment. The mitigation, engineering and other project costs undermined the economics. After those installations, the team told us

its Risk Committee had decided against further lithium-ion BESS deployments. It remained interested in an economic solution with more manageable potential consequences.

The former CEO of a major behind-the-meter solar and storage developer described a BESS deployment programme with numerous potential C&I sites. None proceeded to battery deployment. Several factors contributed, but he identified insurance as the most significant barrier.

These accounts show how requirements arising from the potential consequences of an incident can change both the cost of a project and the willingness to proceed. We cannot use them to quantify how much of the global C&I deployment gap they explain, but the experience of asset owners and developers gives us a commercial basis for the argument, alongside ARENA's published findings.

The market needs standardised approvals and deployment

For C&I storage to scale, customers need confidence that an initially attractive project can get through approvals and become an operating asset. They also need to know that the final Total Deployed Cost will remain close to the initial estimate. Developers need a process they can repeat across suitable sites.

TDC includes the battery and power conversion equipment, engineering and fire-safety studies, consultants and approval work, civil and electrical installation, switchboard modifications and commissioning. It also includes any required mitigation, such as hydrants, firewater containment, blast protection or fire-rated structures. An unexpected requirement in any of these areas can materially change the investment case.

A system designed for standardised approvals and deployment should make these requirements clear early in the project, so they can be applied consistently across suitable sites. Our commercial objective is a repeatable process with minimal site-specific engineering. The economics identified at the start need to survive through to commissioning.

Why institutional trust matters

Predictable approvals depend on confidence in what could happen if a battery fails and, in the measures used to control those consequences. A low estimated failure probability may not be enough if the credible consequences are severe or poorly understood. Fire authorities, insurers, planners and customers need evidence that the remaining exposure is acceptable at the proposed location.

We call that confidence institutional trust. It is built through operating experience, an understanding of failure behaviour, accepted engineering practices and evidence that the controls work. When those things are established, the organisations assessing a project have a familiar basis for making a decision. There is less need for bespoke investigation, redesign or additional mitigation.

Lead-acid has built a substantial foundation of institutional trust through decades of deployment in telecommunications, uninterruptible power supplies and critical infrastructure, including dense urban settings. Its hazards still need appropriate controls, including ventilation and electrical protection. The advantage is that those hazards and their controls are familiar and supported by extensive operating experience.

We believe this gives ArcActive a basis for a standard deployment approach at suitable C&I sites. With a validated system design and clear limits on where and how it can be installed, the organisations involved should be able to assess projects without repeatedly adding requirements that materially change the cost or complexity. Demonstrating that repeatability across sites is a central part of our commercialisation programme.

ArcActive adds the economics for daily cycling

Institutional trust alone does not make a battery commercially attractive. Our contribution is to combine lead-acid's established deployment history with the long life and low cost needed for daily-use energy storage.

Our technology combines proprietary Fabric Structured Electrodes with bipolar architecture to address the failure mechanisms that have historically limited lead-acid cycling performance. Our design-life target is 5,000 cycles at 80% depth of discharge, supported by development testing and failure-mode analysis. Testing and validation are continuing. [6]

The aim is a BESS that offers attractive customer economics and retains those economics through approval and installation. If we demonstrate that combination, developers and property owners should be able to deploy across portfolios of suitable sites, with much less bespoke engineering for each project.

Sources and evidence basis

[1] McKinsey, Enabling renewable energy with battery energy storage systems, 2 August 2023. Forecast of global annual C&I additions in 2030.

[2] ACP / Wood Mackenzie, US Energy Storage Monitor series: 2021 original utility-scale release and subsequently revised CCI figure; Q1 2025 revised history for 2023–2024; Q1 2026 figures for 2025 as reported by Utility Dive; published Q1 and Q2 2026 figures combined for the first half of 2026. Figures are power additions (MW), not energy capacity (MWh). Approximate utility figures are rounded; 2022 CCI is not verified.

[3] ARENA, Community Battery Round 1 Pre-Deployment Challenges and Best Practice Report, September 2025, pp. 22 and 46–47.

[4] ArcActive records of commercial discussions, summarised in its Evidence Book.

[5] ArcActive development materials and September 2026 introduction. Company-supplied technology description and performance target.