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Doing more with what you've got: smarter adaptation for school energy systems

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When we talk about the transition towards decarbonisation of the 22,000-school estate, the conversation too often jumps straight to the big-ticket items such as heat pumps, solar PV, lighting replacements. However, in the real world of tight capital budgets, limited site access, and overstretched premises teams, there's a pressing need for a more pragmatic approach, one that focuses on refurbishing and optimising what schools already have.

At Warneford Consulting, we're seeing a growing appetite among schools for lower cost and less disruptive interventions that can still deliver meaningful carbon and energy savings. This is about a focus on adaptation rather than replacement, sweating the assets, not just stripping them out.

The wider sector context matters too. The Condition Improvement fund (CIF) remains the primary capital funding route for around 50% of academy schools but the qualifying criteria for such an award is on addressing critical failure and the risk of school closure. That makes it hard to secure funding for future focused decarbonisation unless it's piggybacking on a compliance driver. This challenge has been compounded by the withdrawal of the government backed Public Sector Decarbonisation Scheme (PSDS) and Low Carbon Skills Fund (LCSF) for this year, leaving many schools without a clear pathway to fund proactive carbon reduction projects or early-stage investigation work.

So how can schools make progress in the meantime? The answer, we've found, often lies in small but strategic upgrades that make better use of what's already on site.

Boiler optimisation is one good example. At an independent school in East Sussex, they commissioned the installation of a single optimiser unit to improve the performance of an existing gas boiler system. The results were immediate and measurable. The school has saved an average of 15.3% on its annual gas usage, with a return on investment achieved within just 18 months. No plant replacement or major disruption, just smarter use of what was already in place.

These kinds of gains aren't unusual and are becoming ever more common. But they're often missed because they don't involve flashy new technologies or major CAPEX spend.

Another area with quick payback is lighting controls. While many schools have upgraded to LED lighting, far fewer have added occupancy or daylight sensors. Yet doing so can reduce lighting energy use by a further 20–30%. In one secondary school science block, five laboratories were retrofitted with presence detection, reducing lighting runtimes from over 10 hours per day to just four. The payback period was under 16 months.

What's more, modern sensor systems now go beyond lighting control, with models also capable of monitoring air quality, including CO_2 and VOC levels, temperature, and humidity. Such sensors can alert staff when internal conditions are no longer conducive to learning. In some cases, when they even pose a risk to health, prompting ventilation either through window opening or the activation of a mechanical system. These systems are smart enough to also link directly to local heating, cooling and ventilation equipment, enabling automatic adjustment to create an optimal learning environment and improve overall energy efficiency.

Then there's solar PV, which is already common across many school roofs, but its full financial potential is still not being realised. Schools with existing solar installations now have the opportunity to go beyond simple self-consumption and start trading the carbon they save. Through access to verified carbon markets, schools can gain an additional financial benefit of up to £2,850 per inverter installed, per year. That's a new revenue stream from an asset that's already installed, no scaffolding, no panels, no planning.

What unites all these examples is a subtle shift in mindset, from "replace when broken" to "optimise what works." This opportunity, relies heavily on visibility, knowing what assets you have, what condition they're in, and how they're performing. Estate intelligence platforms, decarbonisation energy audits, and targeted condition surveys all help surface these hidden opportunities.

This is also where we're seeing increasing interest in minor works decarbonisation packages. These are small scale, sub £10k projects that can be slotted into summer works or out-of-hours programmes. They typically include refurbishing pumps, adding controls, recommissioning HVAC systems, resequencing boiler stages, or zoning heating loops. They're not headline grabbing, but they are impactful, and they build the groundwork for future, deeper carbon reduction when funds allow.

That's not to say full scale replacements aren't needed. In many schools, legacy fossil fuel heating systems, failed hot water cylinders, or outdated lighting systems will still require capital intensive renewal. But we shouldn't fall into the trap of thinking progress is only possible when the stars align for major funding. There is real, measurable benefit in adapting, optimising and integrating the equipment schools already have.

With the sector facing increasing pressure to decarbonise and improve energy resilience, while also managing rising costs and maintenance backlogs, this kind of practical, data led refurbishment will be a vital part of the strategy.

We’re not saying don’t be ambitious. We’re saying be strategic. And sometimes, the smartest move is not to rip out and start again, but to look at what’s already in place, and ask, “how could this be working harder for us?”