

A Masterclass on Deep Retrofits

Canada's oldest private school, located in Windsor, Nova Scotia, begins long road to net-zero

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Written By Zack Metcalfe with Climate Stories Atlantic

King's-Edgehill is the oldest private school in Canada, founded in Windsor, Nova Scotia, back in 1788. The school consists of 24 buildings on 92 acres — built over the last 237 years, and in a matter of a just a few more, the school plans to make the huge leap of becoming net-zero.

“The headmaster, the school committees, they're all in,” says alumnus William Marshall. “They want to get completely off fossil fuels.”

In addition to being an alumnus, Marshall is director of engineering with the Dartmouth-based LMMW Group, a trio of energy services firms specializing in the many steps of decarbonization. With building assessments, energy modelling, contractor coordination, long-term maintenance planning, and micro-certification training programs, LMMW helps its clients navigate the long road to net-zero.

“Our target is always a deep retrofit,” says Marshall. “And we're not just asking which systems in a building use energy. We're also asking how old the roof is, and what condition the windows are in. What are their natural, useful lifetimes, and when are they coming up so we can make some strategic investments?”

King's-Edgehill is heated by a network of aging boilers, converting oil to hot water with between 65-80 per cent efficiency, “...and that's being really kind,” says Marshall. The plan is to replace them with a centralized air-to-water heat pump facility, boasting efficiencies closer to 310 per cent, supplying hot water, via underground pipes, to low-temperature fan coils, themselves

replacing old copper radiators in each building.

“Once we go full electric on the heating system, we can really get the most out of the solar farm,” he says.

The solar farm Marshall is referring to will be installed on the school grounds, with roll out currently slotted to begin in summer 2026 (coinciding with the rest of the project). Once complete it is expected to deliver between 5-7 megawatts on an ongoing basis, will power the heat pump facility, keep the lights on, and feed excess electricity onto the grid for later retrieval. In time, it might also charge a small fleet of electric buses, which King's-Edgehill ultimately hopes to purchase as part of its decarbonization effort. These, if paired with bidirectional charging, could serve as mobile lithium-ion battery banks, soaking up solar on sunny days and discharging to campus after dark.

In the meantime, says Marshall, excess solar can still be stored on campus, even without batteries. LMMW is planning a network of electric thermal storage (ETS) boilers, in which hot water can be banked at high temperatures for later deployment — when, for instance, solar output is low or when additional heating is required. ETS might not be as versatile as lithium-ion, he said, but they're about one tenth the cost.

“I'm not going to be able to run lights with them,” says Marshall, “but I'm sure as heck going to be able to supply space heating and domestic hot water, which the school always needs. So instead of sending excess solar to the grid, we can always just make hot water.”

Decarbonization is a long process, says Marshall, especially if the right investments are being made at the right times, maximizing the value of existing assets and replacing them, in phases, with efficient alternatives at end-of-life. This makes the best possible use of money, materials, and yes, carbon. King's-Edgehill's deep retrofit will probably commence in the summer of 2025, and LMMW plans to be with them for the long haul, not only to see planning and retrofitting through, but also to train school staff in the subtle art of preventative maintenance, acquainting them with the needs of new buses, panels, and heat pumps.

“It has less to do with how many kilowatts or GHGs we're avoiding,” says Marshall. “It's about helping organizations recognize that efficiency and decarbonization need to be part of their day-to-day and month-to-month operations. They need to consider it the same way they consider payroll or employee benefits. The number of clients we've been able to give this new perspective on their organization is how we measure success.”

Zack Metcalfe is a freelance journalist, columnist and author based in Salmon Arm, BC.

Climate Stories Atlantic is an initiative of Climate Focus, a non-profit organization dedicated to covering stories about community-driven climate solutions.

Zack Metcalfe is a freelance journalist, photographer, columnist, and author. He has written for many publications across Canada, and focuses on the environment, endangered species, land conservation, and climate change. He has nine works of fiction to his name. Zack is also an outdoor adventurer, hiker, and rock climber.



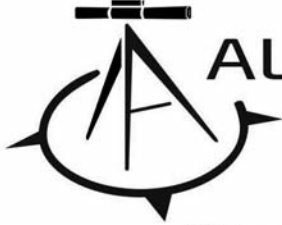
An aerial view of the front of the King's Edgehill campus. Photo courtesy of Kings-Edgehill.



The Windsor Elms Village solar farm - another LMMW group project. Photo courtesy of LMMW Group.

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