Comeau Refrigeration Pursues Net-Zero Certification

Project:
Comeau Net Zero

Location
Nova Scotia, Canada

Comparison Date
2008 - 2024

The Team:

HVAC Contractor:
Comeau Refrigeration Ltd.

HVAC Distributor:
Master Group - Dartmouth Branch

Comeau Refrigeration Ltd. was one of Nova Scotia's earliest adopters of mini-split heat pumps. That decision has shaped the trajectory of the firm.

Today, the company is poised to become the 57th Canada Green Building Council-recognized Net-Zero company in Canada.

"I didn't begin installing mini-splits because I felt they could help reduce climate change," said Comeau. "I began installing them in 2008 simply because the technology worked. Our maritime climate was great for even the early heat pump models available at the time. We witnessed the energy savings and realized how heat pumps would play a critical role in the future of HVAC."

Over the years, Comeau began implementing other green technologies in his company and personal life.

Making Changes

"We doubled down on heat pumps, becoming a Fujitsu Elite Dealer soon after the program was introduced," he explained. "We committed to that brand and never waivered. Meanwhile, we began to conduct our business in a more environmentally conscious manner."

Technicians at Comeau Refrigeration are exceedingly careful when handling refrigerant. They have a fleet-wide no-idling policy, and they carefully recycle old heating and cooling equipment, breaking it apart and sorting the material before taking it to a recycling facility.

They've also added two electric vehicles to their fleet; a Ford Transit van and a Ford Lightening pickup truck.

"I like the EVs more than I thought I would," said Comeau. "They cost roughly 70 percent less to operate than the diesel and gas vehicles in our fleet. They're quiet and they have electrical outlets. It's like having a generator on the jobsite."

Technicians at Comeau Refrigeration are exceedingly careful when handling refrigerant to minimize leaks to the atmosphere.

The company has even taken what some would consider "extreme" measures to offset its carbon footprint. For example, Comeau Refrigeration purchased 30 acres of forested land just a 10-minute drive from Bridgetown, NS, where the company is located. This land – which otherwise would likely have been clearcut – will sequester carbon dioxide and offset the company's emissions. Early calculations on a sample plot indicate this Acadian Forest sequesters 59 tonnes of carbon dioxide and 16 tonnes of carbon annually.

Comeau's interest in operating a carbon-neutral firm began years ago, but nothing official came of it until last year.

Analysis

Comeau's partner, Kris Humphreys, is a Faculty in the School of Environment and Technology at the Nova Scotia Community College. As part of the curriculum, students conduct advanced studies on building performance and energy use, HVAC, emissions, nature-based solutions, and renewable energy.

"Kris asked me if I'd host one of her students for his senior project," said Comeau. "This student, Jake Doiron, had spent two years studying energy sustainability. We were already moving toward Net-Zero, so it was a no-brainer."

Doiron's project "Pathway to Net-Zero," mapped the company's Scope 1 and 2 emissions, and detailed a plan to offset the emissions with nature-based solutions, electrification of the vehicle fleet and renewable energy integration.

Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by Comeau Refrigeration like emissions associated with vehicles. It was helpful that Comeau Refrigeration operates two EVs and the building uses no fossil fuels.

In Comeau Refrigeration's case, Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity. Even though there are no onsite emissions created from electricity used to operate the building, the local utility, Nova Scotia Power Inc., uses some fossil fuels to generate the electricity provided to their customers.

"Jake's work is meticulous," said Humphreys. "He invested over 100 hours in this project. At the end of the study, we made recommendations on how Comeau Refrigeration Ltd. could improve and submitted the data and findings."

Findings

"We found that the Comeau Refrigeration is mindful of their environmental impact," said Doiron. "They're currently working to reduce their footprint and increase building performance. The potential to add a solar photovoltaic array and increase the green space at the shop for additional carbon offset are the next steps that Dale is already working on and planning for. Overall, the changes they've already implemented are exemplary and poise Comeau Refrigeration as an industry leader."

From Doiron's project, Comeau decided to pursue the Zero Carbon Building Performance Standard with the Canadian Green Building Council. There are currently only 56 companies in Canada certified.

Will Marshall, an environmental engineer, and co-founder of LMMW Group Ltd, is the sustainability consultant working on the project. Comeau's goal is to achieve zero-emission operations.

"We'll continue mapping carbon sequestration and storage in the forest to increase the accuracy of the calculations over the entire 30 acres. Mapping 1/100th of an acre to collect the physical data of the small sample took over four hours. It's a huge undertaking," said Humphreys.

"Offsetting carbon through forested land is uncommon on a small scale and certification of credits is costly," she continued. "We use industry-standard metrics to calculate the rates, but there will be no certification of those credits in the near future. Additional certified credits to offset the company's emissions will be purchased from the ZCB certified list of credits. As far as we know, no other HVAC company in Atlantic Canada is doing this. The company is on the forefront of achieving net-zero emissions before 2050."

In July, Comeau Refrigeration hosted a small event to present the findings of Doiron's project. Representatives from Efficiency Nova Scotia and employees of Master Group's Dartmouth branch, where Comeau sources his Fujitsu AIRSTAGE split systems and VRF equipment, were in attendance.

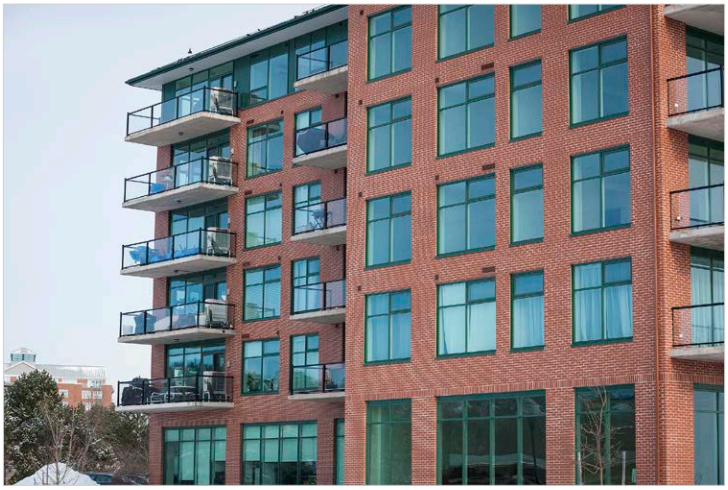
The Time Is Now

When a company wishes to pursue Net-Zero certification, the whole operation and all energy used is taken into consideration. HVAC companies in particular have unique headwinds to overcome.

"We're in the business of mini-split and VRF heat pumps, which have a smaller carbon footprint than fossil fuel appliances, but we certainly don't get a free pass simply because of the high-efficiency products we install," said Comeau.

"Jake calculated how much refrigerant we lost last year," he continued. "Each time we connect gages or use our refrigerant reclaimer, some gas is lost to the atmosphere despite best practices. This may seem insignificant, but the global warming potential of R410 is high. It adds up over the year."

As a result, HVAC companies wishing to achieve Net-Zero certification must offset their carbon footprint. Comeau



Refrigeration has begun doing this by pursuing NZC Building Performance, purchasing the nearby forest property, adding EVs to the fleet, and soon, installing an 18 kW solar array.

"When the industry switches from R-410a to an A2L refrigerant, businesses like mine will require less carbon offset than we do now," explained Comeau. "With a global warming potential (GWP) of 2088, losing five pounds of R-410a is equivalent to driving is equivalent to driving our gas-powered service van 14,181 kilometres. The GWP of R-32, for example, is 655, roughly 70 percent less than R-410a."

Pursuing Zero Carbon Building Performance Certification allows Comeau Refrigeration to continue leading by example. The company also becomes a more attractive employer to new talent and promotes environmentally sustainable concepts to youth considering a career in the trades. Comeau partners with local schools and hosts work placements and an open house for the Options and Opportunities program, open to students in grades 10-12.

"Climate change is a massive global problem, and the best thing we can do is change what's in our power to change while encouraging others to do the same," said Comeau.

"It's time to make those improvements," he continued.

A more mindful generation

Potentially even more impactful than making environmentally conscious improvements in one's personal life is the need to instill similar values in the next generation. Programs like Nova Scotia Community College's Climate Change: Building Performance Technology course hold great promise toward achieving this goal.

The way Doiron is moving forward with his diploma is proof of how interest combined with education will create progress in all segments of industry and society moving forward.

"My interest in sustainability was sparked at home, when my family began developing an off-grid property," Doiron said. "I was enrolled in a kinesiology program previously, but when I learned of this program, I found it more interesting and realized that it could be applied to almost any career I find myself in later."

After graduating from Nova Scotia Community College with honors, Doiron began working at the college's research laboratory as a research assistant. He is, however, pursuing a career as a flight service specialist, which is very similar to air traffic control.

After a few years as a Flight Service Specialist, Doiron will be able to explore other positions within the organization that may be more aligned with sustainability/efficiency.

"Aviation has a massive carbon footprint, and any operational efficiency improvements that can be made should be a priority, second only to safety. My goal is to use flight service as a "foot in the door" position, allowing me to sustainability industry relevant positions in the future."

From the outside looking in, it would be hard to draw parallels between a senior project analysing an HVAC company's carbon footprint and operations in flight service, but that's the beauty of a sustainability education. Instilling values and the ability to think critically about environmental issues equips the next generation of workers and leaders to make greater improvements.

Maybe a sustainability program graduate will eventually become one of Comeau Refrigeration's biggest competitors. Comeau would likely welcome the challenge.

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