

Carbon Engineering



As Carbon Engineering approaches 10 years in Squamish (Swxwú7mesh), British Columbia, we continue to express our gratitude for the support we have received from both the community and local leadership towards our mission. We're committed to being a supportive part of this community, and part of this commitment includes serving as a resource now and through the years ahead.

CELEBRATES 10 YEARS IN SQUAMISH

Carbon Engineering

As it marks 10 years in Squamish, Carbon Engineering readies for its international carbon-capture prime time

The company's decade-long commitment to its local home has pioneered the Direct Air Capture technology now set for massive commercial scale capture

EVAN DUGGAN
FOR THE SQUAMISH CHIEF

During its 10 years in Squamish, Carbon Engineering's team has expanded from 15 to roughly 185 people, and that's a figure that comes up several times during interviews about the company's milestone anniversary in this community.

Team growth and the impact the company is having locally is clearly a source of pride for general manager Toby Stedham. But so too is the broader evolution of the company, its technology and its potential role in global carbon capture success. Today, the company serves in Squamish as an Innovation Centre for Occidental Petroleum Corp, its parent organization. Together, they are ramping up operations in several forms that could eventually provide a meaningful weapon against climate change.

As Carbon Engineering (CE) marks a decade in Squamish, Stedham spoke with The Squamish Chief about the company's latest successes and goals; its genesis in the community; and the future for carbon capture technology and commercialization.

COMPANY'S INNOVATION HELPS TO LAUNCH LARGE-SCALE CARBON CAPTURE

CE, which began as a research project at the University of Calgary in 2009, has pioneered and developed a Direct Air Capture technology that can pull large amounts of carbon dioxide (CO2) from the atmosphere.

Stedham joined CE about seven years ago. "When I joined, it was 35 people," he said. "It was a really scrappy, gritty team that really believed in the mission."

Seeing the team grow and the organization become successful as an



Innovation Centre for carbon capture has been huge personally and professionally, Stedham said. "That first 10 years was about developing the technology, proving at the pilot scale and the demonstration scale that it worked, and really driving everything towards getting that first commercial plant built, and getting that to the point that it's operating."

Houston-based Oxy bought CE in 2023. With Oxy's backing, CE's carbon capture technology will soon be unleashed at a new massive plant in West Texas, called Stratos.

Stedham says their 10-year milestone in Squamish provides a chance to reflect on the exciting, challenging and interesting work that has been accomplished. "Ultimately, [it's] very rewarding being able to see the journey, and the growth, and the success that we've achieved, and also... how the community has embraced us, and how we've been able to contribute to the community as well."

UNDERSTANDING CE'S APPROACH TO CARBON CAPTURE

CE operates its Innovation Centre in Squamish located at Campus Street and Innovation Avenue. There, a large fan pulls air from the atmosphere into a contractor where it meets a liquid capture solution. The captured carbon dioxide is fed into a closed-loop system where it is concentrated into calcium carbonate pellets.

At the next step, the calcium carbonate pellets are heated to release pure carbon dioxide that can be captured and compressed. What's left over is a powder material called calcium oxide, which is then slaked and added back into the system.

The process ultimately eliminates the CO2 captured from the air, generating a feedstock of carbon that can be paired with secure geologic storage to deliver carbon dioxide removal credits, or used to produce low carbon products, like fuels.

Crucially, the system recycles chemicals in a closed-loop and can operate at scale with minimal chemical make-up and waste. It's highly replicable.

"We're really focused on driving forward the technology for direct air capture of carbon dioxide," Stedham said.

That is happening today as Oxy cements the Squamish site for its research and innovation operations while Oxy, with support from CE, prepares Stratos for full-scale production. It will be the world's largest carbon capture operation.

"We're going through commissioning and startup [in Texas] right now," Stedham said, adding that the Stratos plant will have a meaningful impact in removing CO2 from the atmosphere. "I think the team is very proud to be able to see the impact of their work and the potential for this technology to be deployed at a global scale."

CE'S GOOD FIT WITH THE SQUAMISH COMMUNITY

Stedham emphasizes the mutually beneficial relationship CE has with the community in Squamish. He says most of the staff live in town and the local organization is playing a key role in the Texas operations.

"We have a whole bunch of our team deployed down there with them, so sharing the knowledge that we've developed over the last five to 10 years in operating the facilities," he said. "We peaked at 20 [CE] people on site [in Texas] just over a week or two ago ... in support of their startup."

As most know, Squamish is a hotbed of rock climbing, and some employees at CE take part in the sport. Those with climbing skills have been playing an important role at Stratos, helping to lead and provide access for elevated technical work on the towering

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structure. "They're doing quality control checks ... and supporting commissioning activities," Stedham said.

He said alignment between the Squamish and Texas teams has been seamless.

"They came in with decades of industrial operations experience," he said. "They really supported us, helped us, guided us through developing the team, developing the skill sets (and) the ways of operating safely."

REFLECTING ON THE COMPANY'S ORIGINS

CE was founded in 2009 but arrived in Squamish in 2015. They had been conducting lab and bench scale experimentation at the University of Calgary. "We got to the point where it was time to scale-up and build our first pilot plant," Stedham said.

They were looking at a range of locations and Squamish stood out. "It's an outstanding place, and we had the opportunity to take advantage of some pre-existing infrastructure from previous industry that already existed."

The initial location at the oceanfront already had lab space, office space and was set up for handling chemicals and doing the work that needed to be done by CE, Stedham said. "It was a fortunate set of circumstances that led us to Squamish. Everything else that Squamish has to offer has a huge upside."

The community has always been engaged and curious about the work at CE. "There's always a lot of interest, and people want to talk about it [and] show their connection in some way," Stedham said. "We found our people and grew pretty rapidly from there," he said. "We're now a little bit over 185 people so it's been great to see the company establish its home in Squamish and really grow."

The kind of people who live in Squamish tend to value nature and the outdoors and health, so developing solutions to remove CO2 from the atmosphere seems to resonate with many locals, he said.

Squamish Mayor Armand Hurford agrees. He told The Squamish Chief in an interview that he sees CE at the leading edge of climate technology and

as an important economic contributor to the local economy. "It's been instrumental in the changes we've seen in the community," he said. "I also think that this area of green technology and innovation is something that I see Squamish already playing a large role in."

"We're now a little bit over 185 people so it's been great to see the company establish its home in Squamish and really grow."

Over its lifespan in Squamish and through the acquisition by Oxy, Hurford said opportunities likely arose for the organization to move elsewhere. "I'm really happy to see that's not been the case, and I think what we're seeing is actually the exact opposite of that; where they're making a sizeable investment in the community and in the future of their business."

Some people from their team are coming here to work and seeing Squamish for the first time, the mayor added. "They're seeing this company, but also ... the natural surroundings that we're in and I think these things go hand in hand when you're trying to work on the climate crisis. I can't think of a more inspirational place than Squamish to really remind us of what it is that we're looking to protect."

CE EXPECTS BRIGHT FUTURE FOR THE BUSINESS LOCALLY, AND GLOBALLY

Squamish has grown as a community around the company, Stedham said. "Being able to support some of that growth with local employment and local jobs that ... enable people to live in the community and integrate with the community ... is one of the things that we're really proud of," he said. "We've [also] initiated a scholarship for the local high school for people who excel in STEM."

CE looks forward to continuing to innovate to drive down the cost of

carbon capture on a large scale. Stedham said that's their primary focus at their Squamish operations. "The lower that we can drive it, the more and more that technology is going to be accessible and attractive," he said. "That's going to enable us to build facilities around the world."

In Squamish, the Innovation Centre is set to expand. CE currently operates two sites on the oceanfront. "We have a third site that we're in the process of constructing right now," he said.

The new 4.5-acre site is expected to nearly double CE's technology development space and is complementary to the existing centre at the oceanfront. The new site is along Queens Way in the Business Park area. Stedham said that site should come online in the next few years.

"This next phase is about maturing, not just the technology, but also... the company," Stedham said, noting that means expanding on their commercial output in partnership with Oxy.

There needs to be large-scale carbon removals as part of the battle against climate change, Stedham said. "There are a number of organizations working towards that," he said. "We believe that we're well positioned there."

Stedham said they have already sold a million tonnes of pre-sales of CO2 removals. Shopify, a massive Canadian e-commerce company, signed on as an early customer in March 2021. More recently, Microsoft bought 500,000 tonnes of carbon dioxide removals in July 2024. "That really fills up the first few years of capacity for the first commercial plant. Not only is the technology there, but also the markets [are] there. We have a lot of commitments already," he said. "I think we're seeing that the technology is accelerating, and the deployment is moving forward." ■

Editor's note: This special feature was crafted in paid partnership with Carbon Engineering, however the story was written independently by a journalist.

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Carbon Engineering

Meet three Carbon Engineering employees

Behind every company are its people



NAME:
Blake Pilling

POSITION:
Director, operations

YEARS AT CARBON ENGINEERING:
6.5 years

In lay terms, what is the most rewarding part of your job at Carbon Engineering?

The most rewarding part of my job is seeing people unite over a common goal. Managing a team of nearly 30 means all different backgrounds and experiences come together to contribute and grow alongside this business, each working together because we believe in what we do. Sharing our work is also rewarding to me, whether that's connecting with neighbours or presenting at my son's elementary school.

What is one thing you wish more people understood about Direct Air Capture (DAC) technology and its potential?

I wish more people understood that there are so many ways to be a good environmental steward. Working on Direct Air Capture, which pulls excess carbon from the air, is how we're contributing but it's only one way. Addressing climate change is a collective effort with room for all different skillsets.

If you could give younger people one piece of career advice, knowing what you know now about the climate industry, what would it be?

Find the intersection of what you care about, what you enjoy and what you're good at doing. Use this as your guide when you talk to people, do your research and get creative about what's possible. As a chemical engineer, I'm contributing to the climate industry through developing new technology, but there's also many opportunities for progress in existing industries, like energy and utilities.

What is your favourite non-work activity in Squamish?

Getting outside, whether that means building on my mountain biking skills and introducing my two sons to the trails, coaching youth soccer or combing local beaches with my family.



NAME:
Hollie Roberts

POSITION:
Human resources manager

YEARS AT CARBON ENGINEERING:
16 years

In lay terms, what is the most rewarding part of your job at Carbon Engineering?

Seeing the excitement of our super-smart employees when they solve a complicated problem or come up with something brand new that will enhance what we already have or fix a roadblock—and not just our scientists and engineers, I'm including our operators, technicians, technologists and support staff.

What is one thing you wish more people understood about Direct Air Capture (DAC) technology and its potential?

I wish more people understood we're not only talking about addressing residual emissions from sources that can't be easily eliminated today, but we're also developing a tool capable of tackling legacy emissions in the future. Also, I wish people understood there are no bad questions, big or small, and we appreciate the curiosity. For example, locally people ask why there is steam visible on some days at our Innovation Centre. Evaporating water helps us balance the process and manage all the rain we experience in Squamish.

If you could give younger people one piece of career advice, knowing what you know now about the climate industry, what would it be?

Be prepared to work hard but the reward will be working with other like-minded individuals that match your values. Be prepared to challenge the status quo and stick to what you know is right. There are so many challenges to solve in the climate industry so be prepared to offer your unique skills—technical, non-technical.

What is your favourite non-work activity in Squamish?

The epic hiking, with my new favorite being 'The Climb' and enjoying a rewarding beverage at the summit of the Sea to Sky Gondola.

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If you want to really get to know a company, talk to its people on the ground. The Squamish Chief put questions to three current employees from different parts of the company to find out more about Carbon Engineering's employees. All live and work in Squamish.



NAME:
Dr. Andrew Ostericher

POSITION:
Director, technology development

YEARS AT CARBON ENGINEERING:
6.5 years

In lay terms, what is the most rewarding part of your job at Carbon Engineering?

I've dedicated my entire chemistry career to clean tech development with a particular focus on carbon dioxide capture and conversion and it's a privilege to guide the research leading to our next-generation Direct Air Capture (DAC) technologies at CE. I'm deeply grateful to work with an amazing team of like-minded people who have become incredible friends, all the while surrounded by the inspiring natural beauty of Squamish.

What is one thing you wish more people understood about Direct Air Capture (DAC) technology and its potential?

This is straightforward chemistry and not science fiction. DAC mimics how nature manages carbon in photosynthesis. We use clean energy to capture carbon dioxide just like plants use the sun and can choose to either store it or use the carbon as a building block for useful things. DAC is only one tool to support a balanced industry carbon cycle, and not an excuse to delay other initiatives. We still need everything from electrifying transport to restoring our forests.

If you could give younger people one piece of career advice, knowing what you know now about the climate industry, what would it be?

From studying music and researching neurotoxins in algae to moving abroad to pursue chemistry and even distilling whiskey for a short period, my career hasn't been linear, but each experience has shaped who I am and what I do today. Let your curiosity and what you feel is important drive you, and your questions might put you in a position to help shape important change in society, science, the arts or something else entirely.

What is your favourite non-work activity in Squamish?

Ski in the winter, fly fish for the shoulder seasons, mountain bikes and music the whole year round!

We are proud to partner with Carbon Engineering to help make our community safe and healthy for all.

Thank you for your support!



Squamish Helping Hands



Community Christmas Care

Congratulations to Carbon Engineering on 10 years in Squamish!

We are so grateful for their support, along with the partnership of so many businesses and organizations in Squamish. This partnership allows us to support hundreds of families in Squamish around the holidays.

Community Caring for Community Filling hampers with gifts, toys and love in the spirit of Christmas.

Please visit communitychristmascare.com to see how you can be part of Community Christmas Care this year

Local innovation, global impact.

Carbon Engineering is invested in Squamish, with additional research and technology development facilities underway in the Business Park area.



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