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His Invention Could Save the Oil Sands. But Will Anyone Give It a Chance?

September 9, 2015 • By Max Fawcett



With the fruits of his proprietary technology in hand, entrepreneur Cal Broder believes he may hold the cure to the oil sands' market-access blues

At the time, it probably didn't seem like a particularly controversial statement. In an interview printed in the *Newark Advocate* on April 26, 1902, the eminent Scottish engineer and physicist Lord Kelvin was categorical in his rejection of the possibility of commercial air flight. “No,” he said. “I think it cannot be done. No balloon and no aeroplane will ever be practically successful.” Kelvin knew what he was talking about, too – or, at least, everyone else thought he did. According to Garrett Serviss, an American astronomer and one of the period's most prolific science writers, “There is no man of science now living whose pronouncement on almost any scientific question would have equal weight with that of Lord Kelvin.” And yet, it took a pair of bicycle mechanics from Ohio less than two years to prove Kelvin wrong.

“By shipping it as a solid, we get container rates – and container rates are generally the most favorable rates out there. If I put it on a ship, there isn't a tanker in the world that can compete on rates.”

– Cal Broder, BitCrude developer

The example of the Wright Brothers is one that Cal Broder turns to fairly often – and it's no wonder, given the obvious parallels between their story and his own. Broder, after all, also has a fairly unassuming background, with a business degree from NAIT and a history as an entrepreneur who's done everything from running a public accounting practice to selling degreasers and specialty chemicals to customers in the oil sands. His isn't the kind of resumé that you'd expect to produce a potentially game-changing innovation, and yet that's exactly what he says he's done. “Our product is discounted, but why is it discounted? They say it's because it's a heavy oil, but that's not right – Mayan crude goes into the U.S. at a premium to WTI, and has for the last number of years. So from the aspect of heavy crude, it's not discounted because of its quality. It's discounted because of its ability to get to market.” Broder has spent the last seven years trying to solve that puzzle, and he's convinced that he's done it. “It's a totally unique and different approach to things, and one that probably shouldn't work. But it does.”

Where the industry has been mostly focused on turning the heavy crude into a lighter product, Broder's process goes in the exact opposite direction. “When everyone was looking at trying to make it lighter – upgrade it, refine it, dilute it and get it out of the province – we looked at the tendency of it wanting to go heavy and thick and viscous.” By treating heavy oil using his proprietary process, Broder says he can produce a solid product – he calls it BitCrude – that addresses virtually all of the industry's biggest environmental and operational concerns. Its form

has obvious benefits when it comes to getting the product to market, given that it theoretically obviates the need for additional pipeline capacity and because it mitigates any associated spill risk. “Our product is buoyant – it wouldn’t float above the water, but it wouldn’t sink – and in a shipping container it would be even more buoyant.” It’s also less expensive in a shipping container, Broder says. “By shipping it as a solid, we get container rates – and container rates are generally the most favorable rates out there. If I put it on a ship, there isn’t a tanker in the world that can compete on rates.”

Midstream operators would have a hard time competing with it too, he says. “It costs roughly \$135 per barrel to construct a tank farm. Our tank farm is \$10 per barrel, because it’s a shipping container.” The refining units themselves, meanwhile, have a certain Ikea-like quality to them – low cost, easily scalable and totally interchangeable. “These units are modular – everything is plug and play – and you just stack one next to the other as opposed to having a huge 50,000-barrel-per-day processing plant. We designed this thing in such a way that every component on it is replaceable and modular. If anything goes down or has an issue, we just unplug it, put another one in and away we go.”

Better still, his units don’t produce any greenhouse gas emissions. “We don’t release anything in our process. We receive the energy in the way of electricity, and that’s created wherever the plant is, but on our facility there will be no releasing of greenhouse gases. Everything is collected.”

Oh, and the kicker? He says his modified refining process can generate more revenue for upstream producers – way, way more revenue. “Instead of pulling off the diluent and just turning it back to industry, we actually get a higher quality product – gasoline.” That, he says, can add up to some pretty major savings. “Everyone’s saying Saudi Arabia is a low-cost producer, and sure, they are. But we could be the lowest-cost producer in the world if we implemented this process and did it on a cost-reducing basis.”



For the time being, at least, this is about as close as anyone can get to Broder's BitCrude invention without first signing a comprehensive non-disclosure agreement

Photograph Chris Wedman

Now for the multimillion-dollar – or, according to Broder, billion-dollar – question: Is BitCrude for real? It's impossible to say without examining the process that Broder's developed, and he's not going to let that happen without a comprehensive non-disclosure agreement – something that's made it more difficult to convince people that he's on to something. "It's the old adage: if it looks too good to be true, it's not true. I've tried to overcome that over the last couple of years, with great challenges. Part of the reason is that we protect our technology very extensively, and so in order to be able to see it in the past we've required comprehensive confidentiality and non-disclosure agreements, which very few companies have ever wanted to sign." But Leo de Bever, the former CEO of AIMCo, says he's "90 per cent convinced" that Broder's idea is a big one – and that the cost of finding out is worth the expense.

The 7 Deadly Sins of Oilfield Service Companies

By VISTAVU SOLUTIONS **APRIL 2015**

Making money in oilfield services is not always the problem (well, usually) - it's keeping more of what you make. That'll be tough if you are making any of these 7 deadly mistakes. Identify them, correct them, and make more money. ■ [Read more.](#)

“The impact of fitting small, modular, mobile units together into capacity could be big – a new way of exporting bitumen and getting much better margins on it. And if I am wrong, the loss will be \$5 million.” And while business as usual might be comfortable, de Bever says, it hasn’t necessarily been a great business. “There is a tendency to believe that in energy everything has to be big, hot, produced under pressure and with enormous amounts of capital. That model brought us megaprojects with mega cost overruns.”

The real challenge that Broder faces, de Bever says, is getting the industry to give him a fair shake. “The big obstacle in all of this is [people] not wanting to be associated with a technological failure – the embarrassment risk. But I am past that. Either you try and make a difference or you get out of the way.” Still, Broder understands that people like de Bever are still few and far between in the energy sector. “Everybody’s talking innovation, but the last ones that want to use it are the large organizations – and especially the ones in oil and gas,” he says. “They’re afraid of it, I think – they don’t want to disrupt anything. And managers in those organizations don’t want to take a risk on anything, because their necks are on the line.”

That’s why Broder isn’t trying to pitch it solely to industry. Instead, he wants to bring the government into the picture early on, both in order to help develop his technology and ensure it gets applied as widely as possible. “The first step is to get individuals and organizations to know that this exists. And then, we need to start the dialogue about how this can be best implemented. I have ideas, but my ideas aren’t necessarily the best ones. But we need to take an approach that isn’t competitive in nature – we need to be collaborative on this.” He thinks the cost of failing to do that could be significant. “It’s an opportunity to look at things differently throughout the

industry, and make the industry more profitable. Because if we don't make the industry more profitable, there will be casualties. And the casualties will be severe if the prices stay down where people are now forecasting.”

Broder understands why people might be skeptical about BitCrude. After all, he's a 51-year old guy with a background in finance who's proposing a technology that doesn't just challenge the conventional wisdom on how best to process heavy oil but also defies some of its most basic laws. “If you took bitumen at four or five million centipoise and you wanted to turn it into a liquid, in order to pump it you'd need to get it to about 120 or 130 degrees Celsius. We can do the exact same thing at 35 to 50 degrees Celsius. So we're doing something that's fundamentally impossible, and that's what people have a hard time grasping. I can get it to flow like my coffee at 50 degrees Celsius, which is unheard of.” And while that might be a bit more palatable if it was coming from someone with a background in engineering or chemistry, well, it isn't. “I'm not an industry participant. I'm not an industry player. So they don't believe that somebody outside of industry could ever figure this out and come up with a novel way of doing something.”

But de Bever says Broder is exactly the kind of person who we should expect to come up with such a potentially transformative idea. “Experts know all about stuff that exists, and they are comfortable with the way the world is. But few are able to suspend disbelief and think about what can be. True innovation requires that suspension of disbelief, going back to basics and thinking about the world afresh. That requires expertise, yes, but much of that can be acquired or diverted from other purposes. Innovation requires observation of the world around us from a different perspective.” Indeed, according to Naveen Jain, the founder of the World Innovation Institute and a trustee of the XPrize Foundation, “The real disruptors will be those individuals who are not steeped in one industry of choice, with those coveted 10,000 hours of experience, but instead, individuals who approach challenges with a clean lens, bringing together diverse experiences, knowledge and opportunities.”

Still, its hard to overcome the skepticism that Broder's idea, and the claims he makes on its behalf, naturally generates. That's where an innovation ecosystem can be a major asset, according to Kevin Frankowski, the program lead at Kinetica Ventures. “Look, we understand where that skepticism comes from. There is always the fear that someone is trying to promote something that isn't real and has no ability to follow through, and those people exist. But the key is that we as an innovation ecosystem aren't prejudiced and that some of these transformative innovations can come from unexpected sources. If we're willing to get over that prejudice and be open to that, then that's the important first step.” The next step, he says, is building a team of

specialists around people like Broder who can help test and verify his claims and help advance it from an idea into a product. “If we take that approach, then it no longer becomes a gamble,” Frankowski says. “The ones who can’t back up their pitch will get filtered out within the first few moments as they try to move through that process. The outliers, the ones that are legitimate, will make it through. And society benefits from those transformations.”

Broder, for his part, is convinced that BitCrude will create enormous benefits for society – at least, the portion of it that resides in Alberta. “We’re not a low-cost producer right now, but we could become a lower-cost producer and be more competitive with industry outside of Alberta. That would then lead to more jobs and more opportunities to develop the resource.” He’s ready to put his technology to the test, too. In addition to working with Kinetica, Broder plans to build a demonstration unit that will allow potential customers to see it in action. “We’re going to structure it in such a way that you see part of the operation but you don’t see all of it – you don’t see how it works, but you see that it works. What I’m trying to get across to people is that this isn’t a pipe dream. This isn’t something that’s an experiment. It’s not R&D. This is complete. This is a commercial unit that’s ready to start production.” And if that sounds familiar, well, maybe it should. “It’s no different than in 1903, when on December 16 the Wright Brothers said they were going to fly tomorrow. Well, everyone thought they were crazy – and all of a sudden they were flying. And it changed the world.”

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3 Responses

Amarjit Bakshi

September 13, 2015

So would USP 8733439 for only Oil Sands but all oil & gas applications including Shale fracking at low cost as it will give the maximum recovery at moderate temperature and pressure with no water use (hence no waste) and conventional technology being used for over 50 years with this innovation of moderate temperature in this application rather SAGD and CSS. But would operators would like to take advantage recovery double the oil from the same well on continuous basis. Would any body would be

brave to take the advantage and make the things work for themselves.

Why above option is better than USP 8733439 , look up profiles and patent and presentations and look at the patent to get enhanced and environmentally friendly technology.

Jason Swist

September 14, 2015

Hi Max,

Read your article on Broder with interest, unfortunately there is no 'substance' to it. I assume you took his word on this 'bit' (pun intended) because a heavy weight like De bever is involved.

When I read comments like there are no GHG emissions, but we 'need electricity', I tend to get quite skeptical. That's like Suncor's microwave in situ 'technology' being GHG* free, when the reality is it takes more energy to produce a microwave** and that process produces far more GHG than most all other forms of energy.

Even if Broder's 'technology' were a reality (there were no hits on google patent), I see a very solid piece of what looks like rock in his hand, so what does it take technology and energy wise to get that rock back into liquid form? Seems counter intuitive to drill a hole in the ground to liquefy a product so it can be pumped to surface so that it can then be changed back into a solid to be shipped somewhere else and then changed back into a liquid again, no? And further, what he has in his hand is very obviously not something you could put in your gas tank without much more refining, AFTER you change it back into a liquid.

Cheers

Jason

*If you look at the CO2 emissions from each of a gas stove, a kettle and a microwave simply for heating a liter of water, it can be estimated as 33 grams for a stove, 88 grams for a kettle and 112 grams of CO2 emissions for a microwave.

**Heating by gas is ~70% 'greener' than heating by microwave

Jonathan Robert De Mallie

September 17, 2015

Proof as they have and do say is in the Pudding.

Here Oil Pudding, Tar Sands Pudding...

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