

SulfaCHAR™ Filter for Removing Hydrogen Sulfide out of Renewable Natural Gas in Landfills, Wastewater Treatment Plant and Food Waste Processors

Andrew White
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Interview conducted by:
Lynn Fosse, Senior Editor, CEOCFO Magazine

CEOCFO: *Mr. White, what is the concept behind CHAR?*

Mr. White: Our principal product SulfaCHAR™, which from an analogy perspective is very similar to activated carbon. Most people would know activated carbon or activated charcoal as the little black pellets inside a Brita filter. Instead of having a little plastic cartridge in a water filter in your fridge, we build much bigger cartridges on the size of four feet in diameter by seven or eight feet tall. They are filled with slightly bigger black pellets and instead being used to filter water, they are used to filter what is called renewable natural gas. That is methane that is generated from organic waste, so for places like landfills, wastewater treatment plants, food waste processors, by filtering that methane and cleaning it up, our customers are able to create a natural gas replacement product out of those waste streams and use our product to clean their gas.



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CEOCFO: *What are they doing with it if they are not using SulfaCHAR and how much are they recovering?*

Mr. White: Generally, the bare minimum requirement from a legislative of mandate perspective is if it is a landfill, they have to collect the gas and flare it. They collect all the methane with wells and put it up a flare stack and burn it so that we are not putting methane into the atmosphere because it is significantly worse than carbon dioxide as a global warming gas. If they are able to collect it already, they can put it through engines and produce power or they can put it in a natural gas grid. If they are not using SulfaCHAR right now, they could be using a different cleaning technology. There are a few out there from the oil and gas sector. The contaminant in renewable natural gas is hydrogen sulfide and that is what makes sour gas in the traditional sector, sour. The oil and gas industry has some solutions. Ours is targeted at the scale of renewable natural gas so it becomes a more cost competitive option because it is targeted and designed for that sector. Once they are implementing it, they really can capture landfill, most of the gas, waste water treatment plant or other food waste processors they can capture all the gas that is generated.

CEOCFO: *Better, cheaper, more effective - how do you make the leap to utilization?*

Mr. White: From our perspective, it comes down to production and being able to produce enough product to serve the market. We have a tremendous amount of interest industry. We have a customer site set up and ready to go and we just need to produce the product for them. In order to do that, we are building up our production capabilities and we will be

commissioning a one ton per day sulphur char production system in February. We are also looking at having some contract producers. Other companies produce it under license for us so we can get more product out there faster.

CEOCFO: *What was the challenge in developing the technology?*

Mr. White: There are a few. The technology came out of my Master's research at the University of Toronto. From the lab scale research side of things, there were tons of little challenges getting things going, but once we had it solved in the lab. The real challenge has been getting it to scale for a reasonable time frame and capital investment. I am quite proud of the ability to get to where we are with fairly limited capital expenditures. That is in the challenges scaling o a size that we can produce the product commercially.

CEOCFO: *Are you seeking partnerships or investment?*

Mr. White: To complete our current projects and to get the product commercialized, we are fully funded. To scale the way we want to and at the speed that we want to, we would be looking for some additional funding down the road once we have our production capacity up and fully utilized, but it is not an immediate need for the company at the moment.

CEOCFO: *Once people in the industry look at what you are doing, do they understand immediately that it works and it could make sense or do you have to convince people that it can be as effective and cost effective as it is?*

Mr. White: Within the industry, it is a problem that people readily understand they need a solution to. It does not take too long to operate a plant with dirty gas to realize the maintenance issue it causes if you are burning it in an engine onsite to make electricity. If you are putting it into the natural gas grid as a replacement, you have to clean the sulfur out to meet the grid specs. Cleaning it is absolutely understood and the need to do so is understood. It is not such a huge change from other technologies that these operators would be used to using. It is a black pellet that pulls out the contaminant, pulls it out of the gas and stores it on the solid surface. We basically have two selling features that we can bring to these customers. One of the most importantly is that it is the lowest cost solution. That is the key requirement here and we are able to show that pretty effectively. The other, which is a really great benefit is once the other competitors out there, once their material is saturated with the sulfur contaminant, they are left with a product that has be sent to landfills. Once our product is filled with sulfur, we can further use it as a fertilizer product directly without any processing. Most importantly, we have a low cost solution, but secondary to that is we have an environmental solution that creates zero waste and is part of the circular economy.

CEOCFO: *Are there entrenched products and systems that will take more fighting to get around than perhaps in other industries? What do you anticipate?*

Mr. White: The innovation in the space in terms of solid absorbents, meaning like our product, the pellets that become saturated with the sulphur, within that space, there has not been a lot of game changing innovation in quite a while. Our biggest competitor, their product was commercialized in the early 90s, so there is a bit of history of people using different products in the space, but the nice thing about what we are doing is when we prove and show toe the customers that this is a better product, they do not have to install any new infrastructure on their site. They need some tanks to hold the product. We show that ours is better, more cost effective, there is zero waste, and when they switch out their solid absorbents, they can put ours in those vessels, it is a very low CapX switch.

CEOCFO: *Has the industry been looking for a better way?*

Mr. White: Yes, for a couple reasons. One is some of the performance aspects of some of the competing products cause a few headaches for the operators and the second is we are moving to a space where everyone is striving to generate less weight. At the moment we are the only ones that are able to make that claim.

CEOCFO: *Is your process patented? How do you protect your technology?*

Mr. White: We have a US patent granted in the production of SulfaCHAR.

CEOCFO: *Where do you see the primary market?*

Mr. White: It does tend to be a little bit regional. Our customers are people who are processing organic waste. You generally do not want to truck organic waste too far from its source. Between the landfills or the food waste processors or the waste water treatment, between 55 and 65 percent of the US market is in what I call the Northeast and near Midwest, so really around the Great Lakes. It makes sense because that is where the majority of the population is. Then we see a number of customer opportunities in California. If we look beyond North America, North America has about 2500 of these plants, Germany has 15,000. They are not quite the same scale but they are certainly more operations and renewable gas productions in Europe.

CEO CFO: *What surprised you throughout the process getting to where you are today?*

Mr. White: When we launched the company out of the University of Toronto, a lot of the advice was it would take twice as long and cost twice as much, which we thought there was no way that could be true, but it was true and then some I think.

CEO CFO: *Do you know what you need for the plan and do you know how it will work and the mechanics or is there still some more testing that needs to be done?*

Mr. White: I would frame it that it is definitely a commissioning versus a testing. We have done a fair bit of scale up work and a lot of background engineering work to make sure that commercial system is robust yet easy to operate. There is always a chance that there will be some small issues that pop up that either the engineering group did not foresee or there was something about material handling or small things like that. It will be pretty robust and pretty much ready to go once it is commissioned.

CEO CFO: *Why pay attention to CHAR Technologies today?*

Mr. White: If you take a step back, we are making what I like to call a bio-carbon or bio-char type product. The reason we can use the feedstock to make our product as a fertilizer at the end is basically compost. Fiber is leftover after food waste is decomposed and we are looking at a number of applications where we can take these organic fiber waste streams and generate valuable, carbon based products out of them. Therefore, SulfaCHAR is a great opportunity, it is our first one and it is going to make a difference to enable the renewable natural gas industry to move forward. We have a fairly robust R&D plan to look at a couple of other bio-carbon opportunities for us.

CEO CFO: *Final thoughts?*

Mr. White: One of the things that we are strongly supportive of is the clean tech space in general. I think clean tech is making a comeback. There were some issues after it was pretty popular in Palo Alto for a little bit and then there were some unfortunate failures in the space but I think people are starting to realize that environmental technologies are technologies that can be both profitable and benefit the environment and participate in the circular economy. I think the timing right now is really perfect for the reemergence of the popularity of clean tech.

