

alphaDIRECT MANAGEMENT SERIES

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IN FOCUS: CAPSTONE TURBINE CORP., AND ITS EVOLVING OPERATION MODEL, COST-CUTTING AND TARIFF CHALLENGES

This report focuses on Capstone Turbine Corporation (NASDAQ: CPST) and its goal of becoming a zero-waste facility, its changing operation model, cost-cutting and material challenges with tariffs.



Capstone C200 Engine Source: www.capstoneturbine.com

THE alphaDIRECT INSIGHT

Capstone has been striving to execute on its profitability strategy over the past couple of years. Higher after-market revenue is critical to success, but so is streamlining operations and manufacturing to grow product margins. The company has a target product gross margin of 9% in 1Q2021 ending June 30, 2020 compared to a negative 7% in 3Q2020 ending December 31, 2019. The profitability target assumes only modest revenue growth making revenue mix and cost efficiencies the main drivers. In this report, we address several manufacturing issues and opportunities with Kirk Petty, SVP of Operations. Capstone faces unique manufacturing challenges as their products are high precision machines that are even aerospace like in operating parameters. To achieve product margin goals, the company is addressing manufacturing variables such as lower build times, outsourcing, reduced waste, etc. We address these issues as well as several other variables around the manufacturing operations, and we also review how the manufacturing operations are impacting the company's ESG objectives and impact on the broader corporate culture.

CPST Business Snapshot

HQ: Van Nuys, California
NASDAQ Ticker: CPST (NASDAQ)
Full Time Employees: 160
Stock Price: \$2.76*
Market Cap: \$25.17M*
Website: www.capstoneturbine.com
 *As of February 18, 2020



About alphaDIRECT Advisors

alphaDIRECT Advisors is an investor intelligence firm that creates and implements digital content and programs to help investors better understand a company's key drivers including industry dynamics, technology, strategy, outlook and risks as well as the impact they could have on the stock price. alphaDIRECT's expertise encompasses a variety of sectors including Clean Transportation, Emerging EnergyTech, Energy Services, Smart Buildings, Solar, Water Value Chain and Industrial. alphaDIRECT was founded by Wall Street veteran and research analyst, Shawn Severson, after seeing a significant shift in the investment industry that resulted in less fundamental research conducted on small cap companies and a significant decline in information available to all investors. alphaDIRECT's mission is to bridge that information gap and engage companies and investors in a way that opens information flow and analytical insights.

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www.alphadirectadvisors.com
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Participants

Mr. Kirk Petty

**Senior Vice President of Operations
Capstone Turbine Corp.**

Mr. Petty joined Capstone in 2007, serving in many cross-functional leadership positions across operations, customer service and quality. Mr. Petty holds a Bachelor of Science, Summa Cum Laude, in Organizational Leadership from Pennsylvania State University and a Master's of Science in Operations Management with a Supply Chain & ERP concentration from Kettering University. Mr. Petty is also a graduate of the Executive Leadership Development Program at the University of Southern California's Marshall School of Business. In addition to volunteer work with Operation Gratitude, Habitat for Humanity and the American Red Cross, he also holds several professional certifications from the American Society for Quality, including Certified Quality Engineer, Certified Manager of Quality and Operational Excellence, and Certified Six Sigma Black Belt; and is a United States Marine Corps veteran.

Mr. Shawn Severson

**Founder and CEO
alphaDIRECT Advisors**

Mr. Severson is the founding partner and CEO of alphaDIRECT Advisors (ADA). He has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Prior to founding ADA, he led the Energy, Environmental and Industrial Technologies practice at the Blueshirt Group. Mr. Severson was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as

ABOUT CAPSTONE TURBINE CORPORATION

Capstone Turbine Corporation® is the world's leading producer of highly efficient, low-emission, resilient microturbine energy systems. Capstone microturbines serve multiple vertical markets worldwide, including natural resources, energy efficiency, renewable energy, critical power supply, transportation and microgrids. Capstone offers a comprehensive product lineup, providing scalable systems focusing on 30 kW to 10 MWs that operate on a variety of gaseous or liquid fuels and are the ideal solution for today's distributed power generation needs. To date, Capstone has shipped over 9,000 of these systems into 73 countries logging millions of operating hours.

Capstone is committed to improving the efficiency of energy needs around the world, while simultaneously reducing global emissions of pollutants and greenhouse gases. Capstone's systems help end users improve their impact on the environment, while still meeting power and reliability needs. During fiscal year 2019, Capstone saved end-use customers an estimated \$253 million in annual energy costs and 350,000 tons of carbon.

Not only does Capstone enable customers to reduce CO2 and emissions, Capstone applies the same principals to its own environmental footprint and focuses internally on its environmental risks, energy consumption, waste disposal and carbon footprint. Capstone also strives to foster a corporate culture emphasizing its relationship with employees, customers and suppliers in order to ensure that Capstone's corporate values are aligned with those of its employees, customers and suppliers.



*Mr. Kirk Petty
Senior Vice President of Operations*

Shawn Severson: First, I would like to thank you Kirk, for taking the time to speak with the alphaDIRECT network today. Last time we spoke to the company, we discussed [Capstone Turbine and the renewable future](#). Today, our focus will be on Capstone's goal of becoming a zero-waste facility, your changing operation model, cost-cutting and material challenges with tariffs. However, before we get started, could you start by introducing yourself, what brought you to Capstone and your position within the company?



Kirk Petty with the C600S Product

Kirk Petty: Hi, thanks for having me. I joined the Capstone team back in 2007 after serving in the Marine Corps for nine years. I started here on the manufacturing floor as a test technician which helped me to really

understand all of the ins-and-outs of the microturbine product. It was right after Darren Jamison was named CEO, and the largest unit we were building back then was 65kW, mostly for the U.S. market. Today we are building multiple megawatt power plants, and we have shipped product to 73 different countries, so it has been great watching the product and the company evolve alongside each other. I've worked in various positions around the company, including Aftermarket, Quality and Engineering, finally getting the opportunity to lead our Operations team a few years ago, which includes all the facilities, safety, supply chain, warehouse, planning and purchasing and, of course, the manufacturing processes themselves. So full circle in that time, just with more hats now.

Shawn Severson: Thank you, Kirk. We have always looked at Capstone's manufacturing process as very "precision" oriented – even aerospace like, which creates some unique challenges. Can you break out the key parts of the manufacturing process and components that are critical to making a microturbine and also help us understand labor vs. materials and components?

Kirk Petty: I think "precision" is a great word to describe it. Even after 12 years here, I'm still fascinated every day by what happens in the factory. Our product is a jet engine that has one moving part that rotates at 96,000 rpm on the smaller products and 61,000 rpm on the larger products. The one moving part is stabilized in place during operation by our patented air bearings. The balancing techniques are really the "secret sauce" of our turbine manufacturing process. It takes significant skill and attention to detail to balance our

components, and during our system tests, we're monitoring to ensure they're balanced to operate in an envelope that's ¼ of the thickness of a human hair. Like I said, fascinating and almost beyond description.

That said, we're a very lean shop. Labor only makes up less than 25% of the total cost of our products, the rest being purchased materials. There are only about 40 people involved in the actual "build" of the product. All the work cells are set up in modules, and we focus heavily on efficiency, safety, quality and cross-training. This allows maximum flexibility in shifting labor needs.



Capstone Turbine's C65 Rotor Group

Shawn Severson: Where would you say the low hanging fruit is here versus those critical, but challenging issues to address?

Kirk Petty: Operations, like any role in an organization, comes with its own set of challenges. I think one challenge is first understanding what's critical for the day at hand but also not losing sight of the long-term success of the organization. Overall, I have to treat Operations as a cost the organization must incur, and I have to maximize the organization's investment in it by increasing efficiency and plant capacity. That said, daily challenges need to be addressed, and having leaders in place in the position to solve the daily problems allows me to stay focused on the long-term profit maximization of Operations and ultimately Capstone.

Shawn Severson: Is there an outsourcing opportunity for Capstone?

Kirk Petty: I think fundamentally the biggest decision we make in Capstone Operations are those related to what you decide to do in-house and what you choose to outsource. In the end, it always comes down to core competencies. What do we do better than anyone else, and what do we need to control? For anything outside of our core competencies, there's likely someone else who can do it faster, more economically, and with higher quality than you can do yourself. Of course, there's a lot of vetting that goes into the outsourcing processes, but typically we select established suppliers who've historically been good partners to Capstone. To be a good partner, you have to meet our strict quality standards, pricing targets, delivery requirements, lot sizes as well as payment terms and conditions.

Shawn Severson: Let's look to some tangible milestones you hope to achieve going

forward, but also give us a history of the successes you have had to date.

Kirk Petty: Every single goal I've had relates back to two things: Cash and people. When I first came into this leadership team three years ago, I had a few goals in mind. The first was to minimize waste by consolidating our organization into a single facility. We did this in a four-month period without stopping production. The next goal was to make sure that we're building the product as economically as possible without sacrificing customer short term quality and long-term reliability. This involved ensuring we are procuring materials through the supply chain at the lowest cost and building the product in-house with the lowest added costs and the shortest lead-times.

reducing operating expenses. We also managed to do all of these things while keeping our team safe and promoting the family culture we've always strived for. The future goals are much of the same, continuing to address issues that cost the business money, all while keeping the team safe and motivated.



Precision and Repeatability Help to Ensure Quality at Capstone

Shawn Severson: As part of Capstone's drive to profitability, cost reduction is clearly the key factor as management has set this milestone based on only modest revenue growth - short-term at least. The overall cost reduction program has been in place at the company for some time, so can you elaborate on what the targets are and maybe what has changed that they are being addressed now versus earlier in the process?



Lean Manufacturing and 5S: Core Elements of Capstone's Operational Model

A few years ago, a C1000 product took about three weeks to build. Now, it takes just four days to complete the build cycle. Another goal involved ensuring we're turning our inventory around as fast as possible to always be mindful of cash flow. Additionally, training the team to always be mindful of waste, and feel empowered to take action to eliminate it. Accomplishing these goals was a significant step towards

Kirk Petty: A product as technically complex as ours requires materials that aren't readily available on the market, like MAR-M-247 or Samarium Cobalt. Also, some of our components have lead times in excess of 56 weeks, meaning from a cash perspective, you've got purchases and cash tied up out there greater than a year. That's challenging and costly. A traditional approach would be to find alternate materials (and by that they mean substitute

cheaper and readily available materials). However, that takes expensive qualification and development, and I'd rather have our engineers focused on developing the next disruptive technology.

We've taken a different approach. We've taken these challenges in stride, and we've been able to focus on the high-cost drivers and reduce direct material costs by over \$3 million dollars. We've done that by working on value engineering with existing partners and creating competition within the global supply chain. It takes work to go out and find new partners, but having single-sources is risky from both a sustainability and cost perspective. So that's what we've done and what we will continue to do. Create competition in the supply chain and see who comes out on top. Competition keeps costs low and quality high.

Shawn Severson: Let's address the issue of components and materials as this has been an on and off factor for many companies over the last couple of years, especially as it relates to tariffs. Can you provide us with some general insight as to how different tariffs have affected Capstone and what steps can be taken to navigate this maze? Is there anything on the horizon that investors need to be aware of that could impact Capstone?

Kirk Petty: Tariffs have been challenging, but I think what's been more challenging has been the uncertainty it has introduced into the market by the ever-changing messaging available related to this topic. When the tariffs first hit, they hit Capstone very hard. Suddenly, overnight, you had these massive organizations trying to pull their supply chains back domestically overnight. We're a small outfit here. What

happened to Capstone is similar to what happened with a lot of small businesses. American manufactures quickly maxed out their capacity, and their prices went through the roof.

Suppliers that we'd been with for over 20 years suddenly wouldn't return our calls or emails, and when they did, they were raising prices as much as 5x. We wouldn't be sitting here right now having this conversation if our organization didn't respond the way it did. While many went onshore, we had to look offshore. We were able to make great new partners that met our cost, delivery and quality requirements even in this challenging environment. As a bonus, many of them agreed to help share the costs of the tariffs. A lot of the aforementioned cost reductions came out of these efforts. Now, those old suppliers are calling us back and asking about new business, but that's probably a conversation for our next chat.



C200 Engines Ready for Installation

Shawn Severson: Let's move on to a slightly different topic. Capstone is actively working on becoming a zero-waste company. What exactly does that mean and what is your strategy and target timeline. Also, why should investors care about this issue?

Kirk Petty: This is near and dear to my heart, and the environment is one of the core reasons I chose to be a part of Capstone to begin with. Just being here now, I'd like to say that you and I, we're borrowing this planet from our grandchildren. It's not ours, we need to treat it that way. I want to make sure that we're not only manufacturing a green product, but we're doing it in a very green way. We look at every process in the organization, and if there's a byproduct that will affect the environment in a negative way, we take steps to eliminate it. We partner locally with WasteWise in SoCal that helps monitor our impact, and we're targeting being zero waste within the next 18 months or sooner.



Standardized Work: Assembly Line for C1000 Unit

Shawn Severson: Thanks, Kirk. ESG is becoming a greater consideration by many individual and institutional investors. You touched on it earlier, but why is ESG important to Capstone as a company.

Kirk Petty: I sincerely hope and believe that people worldwide are recognizing that the threat of climate change is real, and it is a real problem. Investors are recognizing that companies that are actively working to be a part of the solution are the future, and there's money to be made partnering with companies like Capstone. Darren mentioned in one of our recent releases that there's estimated to be over \$20 Trillion in investment opportunities over the next two decades for companies that are part of this Environmental, Social and Governance (ESG) movement.

Capstone is well ahead of the curve on this topic, as our product and everything we do revolves around 'Clean & Green.' Well, I've touched on the environmental side, but we're also doing a lot on the social responsibility side as well. We have a home-grown volunteer program called "Capstone Cares," which does a lot of work in the community. Our "Capstone Culture Club" promotes a rewarding internal environment through health and fitness awareness as well.

Shawn Severson: The zero-waste objective is a company-wide effort, and maybe we can even say a mantra of the company culture and part of an ESG protocol. How is this being implemented across the company, employee training, hiring practices, etc. and how is this being measured?

Kirk Petty: If you walked through the factory, you can see that we're walking the walk and talking the talk. Our branding and culture are on full display, whether it's a sign showing Capstone unit presence in over 73 countries, how many trees we essentially

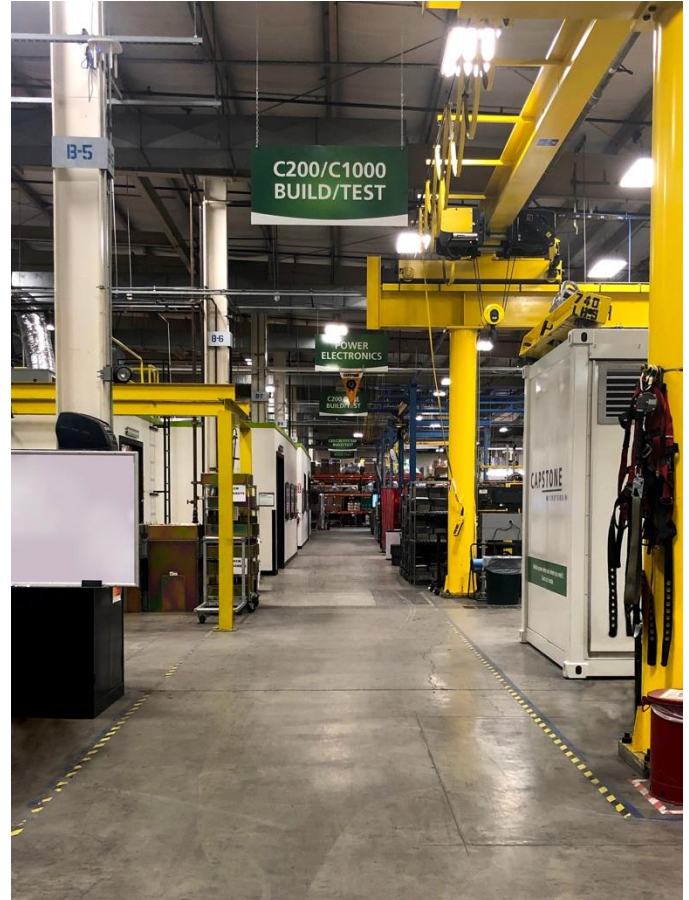
replace annually, or our annual carbon footprint reduction.

We're constantly reminding people of the greater "good or mission" that comes along with being a part of the Capstone family. This is what we look for when we're hiring as well. Darren has instructed us to hire for both experience and culture fit within Capstone. The ideal Capstone employee is someone who is extremely talented, well qualified, self-motivated, and who cares deeply for the planet and the people living around them.

They decide to work at Capstone because of the incredible product and the amazingly talented, dedicated people, and they are willing to work tirelessly to be part of the change they want to see in the world. We are a global, public, high tech manufacturer whose operating expenses are a half or a third of similar-sized companies in the cleantech universe of companies.

Shawn Severson: Thank you, Kirk.

Kirk Petty: Thank you, I appreciated the opportunity to share more information on our operational model.



Factory Floor: Lean Manufacturing at Work

SHAWN SEVERSON FOUNDING PARTNER

Mr. Severson founded *alphaDIRECT* Advisors, a division of EnergyTech Investor, LLC, in 2016 after seeing a significant communication and information gap developing between companies and the financial community. Mr. Severson has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Previously, he was Managing Director at the Blueshirt Group where he was the head of the Energy, Environmental and Industrial Technologies practice. Prior to the Blueshirt Group, Mr. Severson was at JMP Securities where he was a Senior Equity Research Analyst and Managing Director of the firm's Energy, Environmental & Industrial Technologies research team. Before joining JMP, he held senior positions at ThinkEquity, Robert W. Baird (London) and Raymond James. He began his career as an Equity Research Associate at Kemper Securities. He was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Starmine's top three stock pickers.



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